DEC 11 1987

GA 1.13: RCED-87-15BR

United States General Accounting Office

GAO

Briefing Report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives

COMPLETED

October 1986

RAILROAD REVENUES

Analysis of Alternative Methods to Measure Revenue Adequacy

GAO/RCED-87-15BR

ORIGINAL

GAO **United States**
General Accounting Office
Washington, D.C. 20548

Resources, Community, and
Economic Development Division

B-224113

October 2, 1986

The Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

As requested in your April 22, 1985, letter, and modified in subsequent discussions with your office, we are providing you with information and observations on the Interstate Commerce Commission's (ICC) implementation of the railroad revenue adequacy provisions of the Staggers Rail Act of 1980. As you are aware, allowing the nation's railroads to obtain adequate revenues to attract and retain capital is a major goal of the Staggers Rail Act. To facilitate achieving this goal, the act directs ICC to consider the adequacy of a railroad's revenues when reviewing the reasonableness of a particular rail rate. The act also provides revenue inadequate railroads with additional limited freedoms in setting their rates not available to railroads ICC has determined to be revenue adequate.

Over the last several years, rail shippers and their trade organizations have criticized the method ICC uses to measure revenue adequacy. Shippers have based their criticisms on a comparison of ICC's recent findings that none of the nation's railroads are revenue adequate with the statements of knowledgeable financial analysts that railroad financial health has improved.

You took note of these criticisms and asked us to

--provide information on recent trends in railroad financial indicators,

--compare the railroads' financial performance with that of comparable industries,

--determine how ICC measures revenue adequacy,

--identify alternative approaches for measuring revenue adequacy, and

--determine if any railroads would be revenue adequate if alternative approaches were used.

On April 28, 1986, we briefed your office on our work, and this briefing report presents you with the final results of our study.

We have divided the briefing report into five sections. The first section summarizes the report and provides our observations. The second section briefly examines the legislative background of the revenue adequacy provisions of the Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Rail Act. This section also examines ICC's implementation of those revenue adequacy provisions and its practical impact.

Section three of this report discusses trends in railroad financial and operational health. In addition to the rate of return on net investment measure ICC currently employs, we present information on the results of nine other financial ratios and indicators, such as return on equity, operating ratio, and bond rating. These indicators were chosen on the basis of their importance to the financial community in providing an overall picture of the industry. Several of these indicators were used to develop a comparative analysis between the railroads and similar industries.

The fourth section presents an analysis of alternative approaches for measuring railroad revenue adequacy. We selected four methods that represented the major approaches for measuring revenue adequacy used by ICC or proposed by railroads, shippers, or in legislation. The four approaches are:

--ICC's existing approach,

--a traditional approach,

--a current cost approach, and

--a multiple indicator approach.

Using each of these methods, we determined the revenue adequacy of the nation's major railroads.

The fifth section describes our objectives, scope, and methodology in preparing this briefing report. Details on data compilation and selection of the railroads we evaluated are presented in this section. Limitations to our data collection are also discussed.

We found that recent trends in railroad financial indicators provided a mixed picture of railroad financial health. For example, while return on investment and equity have improved, these returns are still below the level ICC believes is necessary to attract and maintain capital. On the other hand, railroads appear more able to service their debt load and railroad cash flow has increased, due in large part to the benefits provided by the Economic Recovery Tax Act of 1981.

Currently, the Congress, ICC, and the Railroad Accounting Principles Board are evaluating alternative approaches for measuring revenue adequacy that are similar to the methods we analyzed. Although each of the approaches we evaluated uses different techniques to measure revenue adequacy, we found that no major railroad would have been found revenue adequate in 1984 using any of these approaches. In addition, we found that two of the methods, the current cost approach and the multiple indicator approach, have key weaknesses that are likely to make them unrealistic alternatives for measuring revenue adequacy.

On the other hand, we found that ICC's existing approach and the traditional approach have certain important similarities that could form an acceptable basis for measuring revenue adequacy. Specifically, both methods use a generally accepted regulatory and economic approach for measuring the profitability of a regulated firm. In addition, both approaches use reported financial data and can provide unambiguous results. In considering a method for calculating revenue adequacy, the Congress, ICC, and the Board will need to resolve difficult issues regarding ICC's use of depreciation accounting, the treatment of railroad deferred taxes, and the appropriate way to measure the cost of railroad debt.

As requested by your office, we did not obtain official agency comments. As arranged with your office, we plan no further distribution of this report until 30 days after the date of this letter, unless you publicly announce its contents earlier. We will then send copies to the Chairman, Senate Committee on Commerce, Science, and Transportation; the Chairman, ICC; the Secretary, Department of Transportation; the Director, Office of Management and Budget; and other interested parties. If we can be of further assistance, please contact me at (202) 275-7783.

Sincerely yours,

Herbert R McLure

Herbert R. McLure
Associate Director

Contents

Page

SECTION

1 REPORT SUMMARY AND GAO OBSERVATIONS 7

2 BACKGROUND 21

3 TRENDS IN RAILROAD FINANCIAL INDICATORS 35

4 ALTERNATIVE APPROACHES FOR MEASURING RAILROAD REVENUE ADEQUACY 69

5 OBJECTIVES, SCOPE, AND METHODOLOGY 127

APPENDIX

I COMPARISON OF RRB AND DEPRECIATION ACCOUNTING 132

II METHOD USED TO SELECT INDUSTRIES FOR COMPARISON WITH RAILROADS 134

III COMPUTATION OF THE 1984 EMBEDDED COST OF DEBT 137

IV COMPARISON OF 1984 FINANCIAL RATIOS OF SELECTED CLASS I RAILROADS TO ICC STANDARDS 139

FIGURES

1.1 1984 revenue adequacy results--ICC's existing approach 11

1.2 1984 revenue adequacy results--"traditional" approach 13

1.3 1984 revenue adequacy results--current cost approach 15

3.1 Net rail operating income--class I railroads 38

3.2 Rate of return on net investment--class I railroads 40

3.3 Rate of return on equity--class I railroads 42

3.4 Operating ratio--class I railroads 44

Page

FIGURES

3.5 Current ratio--class I railroads 46

3.6 Fixed charge coverage--class I railroads 48

3.7 Capital structure ratio--class I railroads 52

3.8 Capital expenditures--class I railroads 54

3.9 Cash flow--class I railroads 56

3.10 Cash flow percentage--class I railroads 56

3.11 External sources of funds--class I railroads 60

4.1 1984 revenue adequacy results--ICC's existing approach 76

4.2 1984 revenue adequacy results--"traditional" approach 86

4.3 1984 revenue adequacy results--current cost approach 100

TABLES

1.1 1984 revenue adequacy results--multiple indicator approach 17

2.1 ICC revenue adequacy determinations 26

3.1 ICC determined cost of capital 41

3.2 ICC determined cost of equity capital 43

3.3 Major class I railroad bond ratings 50

3.4 Discretionary cash flow--class I railroads 59

3.5 Railroad equipment debt: 1980-84 62

3.6 Funds from property sales 63

3.7 Trends in asset base components 64

3.8 Abandonments and installation of locomotives and freight cars 65

3.9 Interindustry comparison using selected financial indicators, 1984 66

Page

TABLES

4.1 Revenue adequacy shortfall under ICC's existing approach 77

4.2 Revenue adequacy shortfall comparison 87

4.3 Comparison of using the cost of embedded debt in alternative cost of capital determinations 89

4.4 Impact of including deferred taxes in ICC's existing revenue adequacy approach 90

4.5 Comparison of 1984 ROI using predecessor and written-down asset costs 93

4.6 Revenue adequacy shortfall comparison 101

4.7 Additional net railway operating income needed to be revenue adequate in 1984 102

4.8 Revenue adequacy determination for 1978 using multiple indicator approach 113

4.9 Major indicators used by ICC and industry analysts to assess railroad financial health 116

4.10 Comparison of multiple indicators selected 120

4.11 1984 revenue adequacy results--multiple indicator approach 122

5.1 Major class I railroads 130

ABBREVIATIONS

CSA	Conditional Sales Agreement
ERTA	Economic Recovery Tax Act of 1981
ETC	Equipment Trust Certificate
4R Act	Railroad Revitalization and Regulatory Reform Act of 1976
GAO	General Accounting Office
ICC	Interstate Commerce Commission
ROI	return on net investment
RRB	Retirement-Replacement-Betterment
TNOC	Trended Net Original Cost

SECTION 1

REPORT SUMMARY AND GAO OBSERVATIONS

BACKGROUND

The concept of measuring revenue adequacy was first introduced in the Railroad Revitalization and Regulatory Reform Act (4R Act) of 1976. Concerned with the deteriorating financial performance of the nation's railroads, the act directed the Interstate Commerce Commission (ICC) to develop standards for determining if the railroads were earning adequate revenues to cover their operating costs and to provide a reasonable return on capital provided by investors.

Over the next 4 years, concerns about the financial health of the railroads continued, and in 1980, the Congress passed the Staggers Rail Act, which deregulated a significant portion of the railroads' business. Several provisions of the Staggers Rail Act enhanced the importance of measuring revenue adequacy--such as requiring ICC to determine annually which railroads are revenue adequate and requiring ICC to consider a railroad's revenue adequacy when reviewing the reasonableness of rates on shipments where the railroad had market dominance. Railroads that are not revenue adequate are also allowed to adjust their rates without ICC oversight on market dominant traffic--situations where the railroads have no effective competition--and on light density lines--rail lines that carry small amounts of traffic. (See p. 25.)

ICC has used two different methods to measure revenue adequacy. After the 4R Act was passed, ICC adopted a revenue adequacy standard that employed multiple financial indicators to measure a railroad's financial condition. Following the adoption of the Staggers Rail Act, ICC changed its revenue adequacy standard by selecting a single standard which compared a railroad's return on net investment (ROI)[1] with an ICC-determined cost of capital.[2] ICC considers railroads with an ROI greater than or equal to the cost of capital to be revenue adequate. Using this approach, ICC has not found any railroad revenue adequate in the last 3 years. (See p. 27.)

---

[1] ROI is a commonly used indicator of financial health that measures the ability of a firm to derive income from its investments. For a railroad, ROI is calculated by dividing net income from railroad operations by the depreciated original cost of the railroad's assets.

[2] The cost of capital is the cost that firms must pay to obtain funds to purchase major assets such as machinery or buildings. For a railroad, the cost of capital has two major components--the interest rate it must pay lenders in order to borrow funds and the rate of return stockholders must receive in order to invest in the railroads' stock.

TRENDS IN RAILROAD FINANCIAL INDICATORS SHOW A MIXED PICTURE

Recent trends in railroad financial indicators provide a mixed picture of railroad financial health. On the positive side, the returns on equity and investment of the nation's Class I railroads,[3] while modest, have increased. In addition, as a whole, the railroads appear more able to service their debt load, which has assumed a lower proportion of their total capital. Finally, railroad cash flow--net income, depreciation, and deferred taxes--has increased, owing in large part to the benefits provided by the Economic Recovery Tax Act of 1981. (See p. 36.)

Indicating a more guarded picture, however, overall railroad returns are still below the level ICC believes is necessary to attract and maintain capital. Further, the railroads' operating ratio, a measure of efficiency calculated by dividing operating expenses by operating revenues, has not reached what ICC believes is a desirable level. Finally, discretionary cash flow--cash flow less capital expenditures and dividends--had only its second positive year in the last decade during 1984.[4] (See p. 36.)

Despite this mixed picture, the nation's railroads have continued to invest substantial funds in their plant and equipment. From 1980 to 1984, the railroads spent over $14.9 billion in capital expenditures, focusing primarily on improving and upgrading their track and structures. At the same time, however, in an effort to streamline their operations and reduce operating costs, the railroads have continued to abandon significant amounts of track and equipment.

Funds for these capital expenditures have come from two primary sources. One has been the railroad's internal cash flow. The other has been specialized debt instruments known as Equipment Trust Certificates and Conditional Sales Agreements that are used to purchase locomotives and rail cars. (See pp. 56 to 63.)

ALTERNATIVE APPROACHES FOR MEASURING REVENUE ADEQUACY

In recent years, ICC's method for determining railroad revenue adequacy has come under scrutiny by various groups, including the Commission itself. After comparing improvements in the financial health of the nation's largest railroads with ICC's revenue adequacy determinations, shippers and their trade associations have asked whether ICC is measuring revenue adequacy correctly. In addition, the Railroad Accounting Principles Board is currently reviewing certain aspects of how ICC determines revenue adequacy as part of its mandate under the Staggers Rail Act to establish cost accounting principles for the railroad industry. Finally, ICC recently proposed a complete review of how it determines revenue adequacy.

---

[3] ICC defines a Class I railroad as any railroad earning more than $87 million in annual revenues. In 1984, there were 28 Class I railroads. Together they accounted for over 95 percent of the total revenues earned by all of the nation's railroads.

[4] We use calendar year data throughout this report. Data was available only through 1984.

We found that there are four general methods for determining railroad revenue adequacy:

--ICC's existing approach.

--A "traditional" approach.

--A current cost approach.

--A multiple indicator approach.

For each method, we (1) determined how it is used to measure revenue adequacy, (2) evaluated the results of its application using 1984 data, the most recent year available, for the nation's major Class I railroads, and (3) reviewed the major issues associated with its use. Although each approach uses different techniques to measure revenue adequacy, we found that no major Class I railroad would have been found revenue adequate in 1984 using any of these approaches.

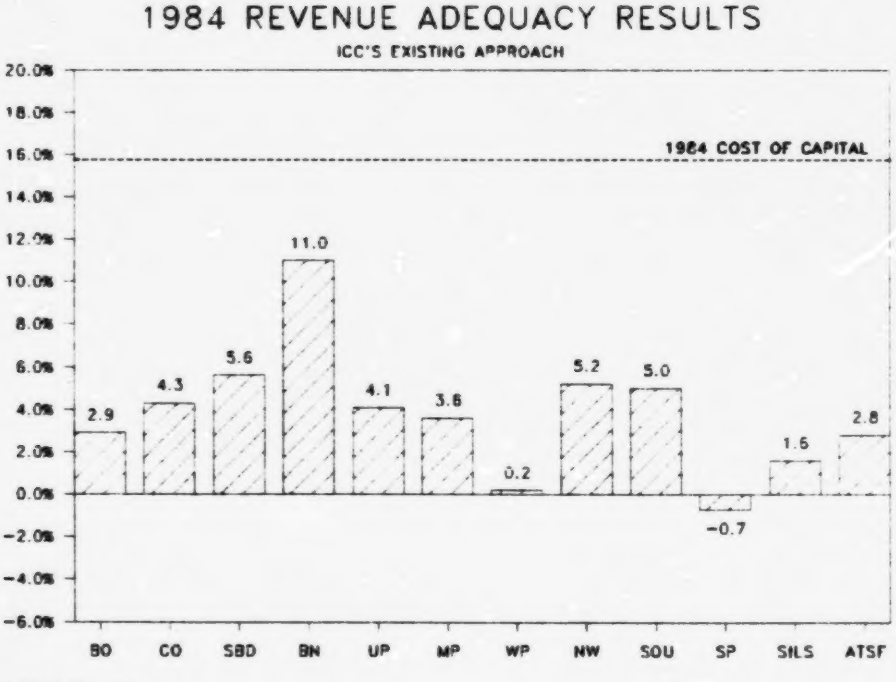
ICC's existing approach

ICC's existing approach compares the current cost of capital with each railroad's ROI using a unique accounting method known as Retirement-Replacement-Betterment (RRB) accounting.[5] ICC adopted its existing approach because it believed that ROI equal to the current cost of capital was the minimum needed to attract and maintain capital in the railroad industry. For 1984, ICC determined that the current cost of capital was 15.78 percent. As shown in figure 1.1, no Class I railroad we evaluated, however, had an ROI that was this high. The Burlington Northern Railroad's ROI was the closest (11.0 percent), while the Southern Pacific's ROI was the most distant (-0.7 percent).

---

[5] RRB accounting is an accounting method that is used only in the U.S. railroad industry. Under RRB accounting, railroad track is entered on the railroad's accounts as an asset but is not systematically depreciated. Track replacements are treated as expenses for the year in which they occur. The cost of track improvements, also known as betterments, is divided between the railroad's annual expenses and its asset accounts. For a detailed explanation, see appendix I.

Figure 1.1



SOURCE: ICC

Legend:

BO - Baltimore & Ohio RR
CO - Chesapeake & Ohio Ry
SBD - Seaboard RR
BN - Burlington Northern RR
UP - Union Pacific RR
MP - Missouri Pacific RR

WP - Western Pacific RR
NW - Norfolk & Western RR
SOU - Southern Ry
SP - Southern Pacific RR
StLS - St. Louis & Southwestern RR
ATSF - Atchinson, Topeka & Santa Fe RR

Rail shippers, their trade associations, and the National Association of Regulatory Utility Commissioners have criticized ICC's existing approach for using RRB accounting instead of the more generally accepted depreciation accounting for calculating ROI.[6] Although ICC requires the use of depreciation accounting for financial reporting purposes, it has used RRB accounting for revenue adequacy purposes because it believes that RRB accounting more adequately compensates the railroads for the impact of inflation.

---

[6] Depreciation accounting is an accounting method that systematically allocates the cost of assets, such as machines and buildings, over their estimated useful lives. These costs are accounted for by charging an annual depreciation expense against income.

ICC's cost of capital determinations have also been criticized on several counts, including ICC's use of the current cost of debt and how ICC treats deferred taxes. Shippers have noted that ICC's use of the current cost of debt in determining the cost of capital is contrary to the practice of other state and federal regulatory commissions, where the embedded cost of debt is used. The current cost of debt is the interest rate that the railroads must pay to borrow funds in the current year. The embedded cost of debt is the interest rate the railroads must pay on all the funds they have borrowed over the years. Shippers argue that the use of the current cost of debt will overstate the actual cost of debt when the current debt rate is above the embedded rate as it was in 1984, while understating it when the current debt rate falls below the embedded rate.

Rail shippers and their trade associations have also criticized ICC's existing method for its failure to recognize deferred taxes as a source of capital. Deferred taxes are created by the difference between the depreciation rates allowed by ICC and the rates used in tax computation. These critics argue that deferred taxes represent an important, "zero-interest" source of railroad capital. Unlike ICC, state and federal regulatory commissions typically account for deferred taxes in determining the cost of capital. (See pp. 78 to 80.)

Traditional approach

The traditional approach is based on the methods state and federal regulatory utility commissions use to determine ROI and the cost of capital as part of periodic rate-setting proceedings. The traditional approach, while similar to ICC's existing approach, adjusts for the criticisms leveled against ICC's existing approach by

- --using the embedded cost of debt[7] instead of the current cost of debt,
- --including deferred taxes as a zero-interest source of capital, and
- --calculating ROI by using depreciation accounting instead of RRB accounting.

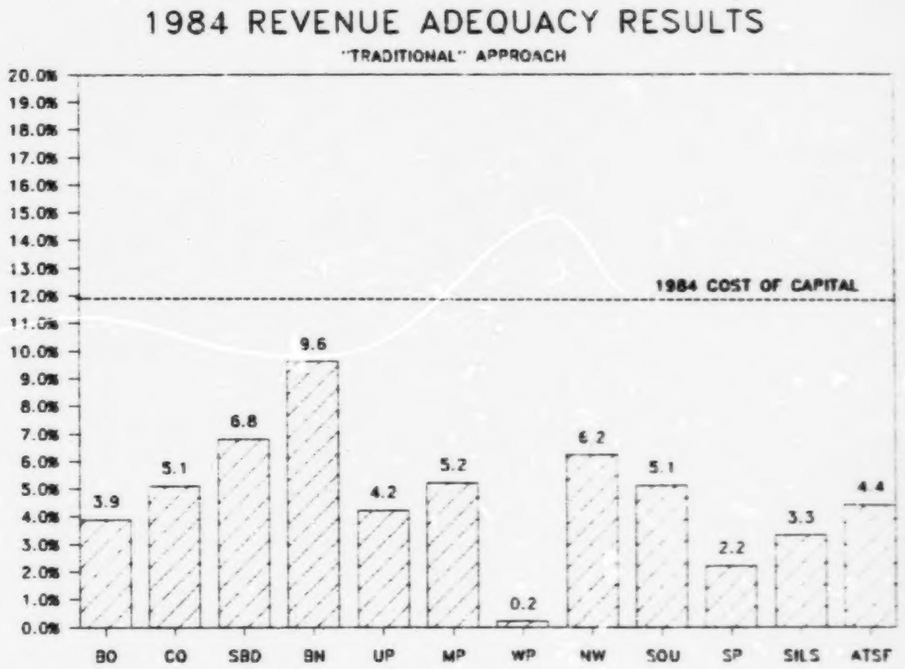
The traditional approach is similar to the approach contained in proposed legislation (The Consumer Rail Equity Act--H.R. 4096, S. 417) and is virtually identical to ICC's May 30, 1986, proposal to modify how it determines revenue adequacy. (See pp. 83 to 84.)

Using a traditional approach, we estimated that the 1984 cost of capital was 11.84 percent. Although most railroads' ROI under depreciation accounting is higher than under RRB accounting, none of the Class I railroads we evaluated reached the traditional cost of capital level in 1984. As shown in figure 1.2, the Burlington Northern Railroad was the closest to revenue adequacy under this approach with a return of 9.6 percent.

---

[7] Appendix III explains how we computed the 1984 embedded cost of debt.

Figure 1.2



SOURCE: ICC

While shipper organizations support the traditional approach, the railroads have opposed its use of the embedded cost of debt and its treatment of deferred taxes. They believe that revenue adequacy should be a forward-looking concept that reflects the current cost of acquiring new debt not the cost of satisfying existing debt holders. They have objected to the inclusion of deferred taxes in the cost of capital because they believe that including deferred taxes denies the railroads a return on these funds and that without such a return the railroad would have an incentive to invest these funds in other businesses. Proponents of including deferred taxes point out that investors do not provide these funds and that to allow the railroads to earn a return on these funds is unnecessary. (See pp. 89 to 90.)

Two issues are associated with ICC's use of depreciation accounting--the use of "predecessor costs" and the "write-up" of the rate base allowed when ICC, in 1983, converted for financial reporting purposes from RRB accounting to depreciation accounting.

When a railroad has had the book value of its assets reduced, or written-down, as the result of a sale or reorganization, ICC has used the presale or "predecessor costs" of the assets to calculate ROI on a depreciation accounting basis. This can reduce reported ROI. For example, while the ROI of the Seaboard System would be 6.8 percent using written-down costs, it is only 5.7 percent using predecessor costs. Officials in ICC's Bureau of Accounts defend this practice on the grounds that if they used the written-down costs, the new owners would not earn enough of a return to replace the assets they had purchased when those assets wore out.

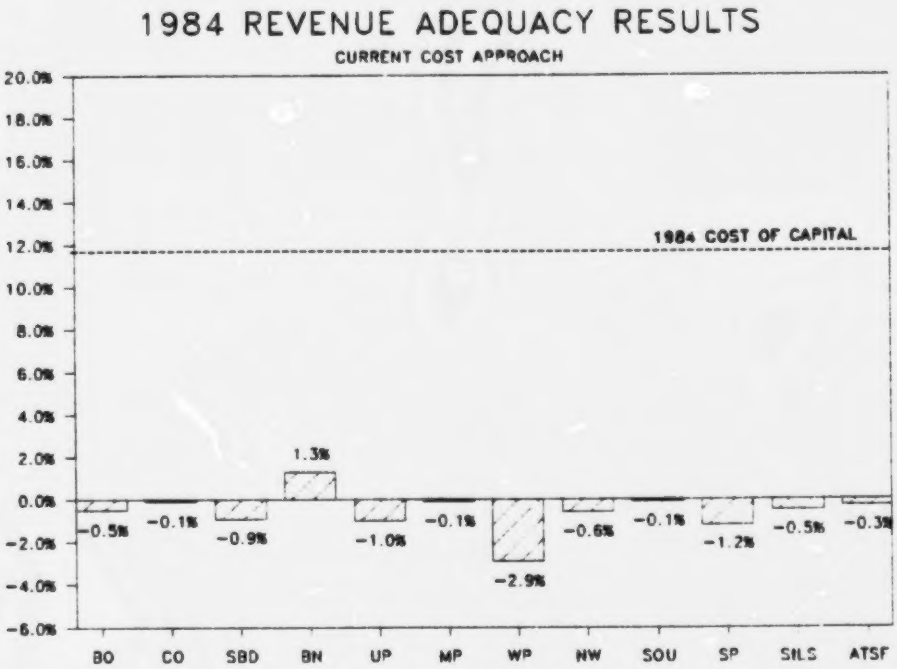
The second issue involves the "write-up" of the investment base permitted when the railroads converted from RRB to depreciation accounting. In making the change, the railroads were permitted to restate their financial statements as if depreciation accounting had been used in previous years. Rail shippers object to this adjustment, arguing that it allows the railroads to recover expenses associated with the replacement of track twice. ICC, on the other hand, has viewed the adjustment as appropriate, and has argued that expenses incurred under the RRB system were for track that wore out in the past, while new depreciation expenses are to compensate for track that is now deteriorating. (See pp. 93 to 94.)

Current cost approach

In March 1983, ICC proposed adopting a current cost approach for calculating ROI and, thus, determining revenue adequacy. Concerned about the distorting effects of price inflation on the railroads' financial data, ICC proposed to determine revenue adequacy by comparing the real (inflation adjusted) cost of capital with an estimate of ROI based on the current reproduction cost of the net asset base. The estimated current cost to reproduce the railroads' assets would be developed by applying a series of indexes to original cost asset information. Depreciation charges would also be calculated using the same indexes.

We estimated that the real cost of capital for 1984 was 11.58 percent. (See p. 98.) None of the Class I railroads we evaluated had an ROI on a current cost basis equal to this level. As shown in figure 1.3, because the current cost approach increases depreciation expenses and the asset base, railroad ROIs fall sharply under this approach, increasing the revenue adequacy shortfall of many railroads. For example, while the return of the Burlington Northern Railroad was 11.0 percent in 1984 under ICC's existing approach--a revenue adequacy shortfall of 4.8 percentage points--its return under the current cost approach would be only 1.3 percent, creating a 10.3 percentage point shortfall. More importantly, in order to meet the real cost of capital under the current cost approach, the Burlington Northern Railroad would have had to earn an additional $1.8 billion in net railway operating income in 1984. In contrast, its 1984 net railway operating income on a RRB basis was about $467 million. (See pp. 101 to 102.)

Figure 1.3



SOURCE: ICC

Shippers have vigorously opposed this approach on several grounds, including the following:

--Applying current cost is contrary to regulatory and industry practice and would make railroad reporting noncomparable to other industries.

--Converting the original cost of the railroads' assets to current cost requires considerable subjective judgment.

--Alternative methods exist to account for inflation.

Adopting a current cost approach could also lead to problems with overstating the value of the railroads' asset bases. Specifically, many older railroad assets have become economically obsolete and are likely not to be replaced. Railroads have been abandoning these assets; however, recent studies have indicated that there may still be extensive excess capacity in the railroad industry. Because of the way in which ICC's current cost approach works, these older obsolete assets could represent a much greater proportion of the asset base under current cost accounting than under original cost accounting. No satisfactory method has been identified to address this problem. (See pp. 105 to 110.)

Multiple indicator approach

Prior to the Staggers Rail Act, ICC evaluated multiple indicators in order to determine revenue adequacy. ICC

--compared ROI with the cost of capital,

--evaluated various financial ratios, and

--prepared a "funds flow analysis" that was designed to compare railroad capital needs with funds from operations and capital sources.

Because a similar approach is often used by financial analysts to evaluate railroad stocks and bonds, this approach has been advanced as a method for determining revenue adequacy.

To illustrate the application of a multiple indicator approach, we selected seven financial indicators commonly used by stock and bond analysts and ICC to evaluate the railroads' ability to attract capital and repay their debt. (These indicators are defined on p. 120.) We compared each railroad's performance with standards ICC has developed.

As shown in table 1.1, none of the Class I railroads we evaluated met the standards for all the indicators. Once again the Burlington Northern Railroad had the best performance, surpassing ICC's standards for all of the indicators with the exception of return on investment and return on equity.

Table 1.1

1984 Revenue Adequacy Results—Multiple Indicator Approach

	Standard Met for 1984						
Railroad	Return on investment	Return on equity	Operating ratio	Current ratio	Fixed charge coverage	Capital structure	Bond rating
Baltimore & Ohio	No	No	No	Yes	No	Yes	Yes
Chesapeake & Ohio	No	No	No	Yes	Yes	No	Yes
Seaboard	No	No	No	Yes	Yes	Yes	Yes
Burlington Northern	No	No	Yes	Yes	Yes	Yes	Yes
Union Pacific	No	No	No	Yes	Yes	Yes	Yes
Missouri Pacific	No	No	No	No	No	Yes	Yes
Western Pacific	No	No	No	Yes	No	No	Yes
Norfolk & Western	No	No	Yes	Yes	Yes	No	Yes
Southern	No	No	Yes	Yes	Yes	No	Yes
Southern Pacific	No	No	No	No	No	Yes	Yes
St. Louis & Southwestern	No	No	No	Yes	Yes	No	Yes
Atchison, Topeka & Santa Fe	No	No	No	Yes	Yes	Yes	Yes

ICC and railroad officials have identified several difficulties with the application of a multiple indicator approach. First, many of the indicators that could be used are short-term indicators of financial health, while revenue adequacy is often viewed by ICC and the railroads as a long-term concept. Second, as we found, there are no widely agreed-upon standards to apply in evaluating the results of the indicators. Finally, we could find no generally accepted method to weight the indicators--requiring considerable judgment in evaluating the results.

GAO OBSERVATIONS

Several initiatives are under way that are likely to result in changes in the way ICC determines revenue adequacy. The proposed Consumer Rail Equity Act would require ICC to employ a method similar to the traditional approach and to evaluate other financial indicators when determining revenue adequacy. On May 30, 1986, ICC issued a public notice stating that it was going to reexamine its method for determining revenue adequacy. In this notice ICC proposed adopting a method very similar to the traditional approach. Finally, the Railroad Accounting Principles Board, as part of its mandate under the Staggers Rail Act, has been examining how ICC determines ROI and the cost of capital. The Board is expected to establish principles and report to the Congress in early 1987. ICC will then initiate a rulemaking proceeding to implement the principles.

Our review has identified several factors that need to be considered as the Congress, ICC, and the Board conduct their evaluations. Two of the methods, the current cost approach and the multiple indicator approach, have key weaknesses that are likely to make them unrealistic alternatives for measuring revenue adequacy. On the other hand, ICC's existing approach and the traditional approach are characterized by important similarities that argue for the continued use of a standard that compares ROI with the cost of capital. If this overall approach is retained, however, the Congress, ICC, and the Board will need to resolve difficult issues regarding ICC's use of depreciation accounting, the treatment of deferred taxes, and the appropriate cost of debt.

Current cost and multiple indicator approaches appear impractical

The current cost approach is encumbered by estimation problems and is out of the mainstream of financial analysis methods used by regulators and the financial community. At a time when the railroads appear to be streamlining their systems in order to improve their financial performance, this approach could assign an artificially high value to the assets the railroads are seeking to discard. In doing so, the current cost approach would make it much harder for individual railroads to achieve revenue adequacy, requiring them, in order to be revenue adequate, to increase their net railway operating income by several orders of magnitude. Since the Staggers Rail Act expects ICC to balance the railroads' revenue requirements against the needs of shippers for protection against abuses of market power, decision makers need to consider whether this alternative achieves that balance by requiring such large increases in operating income before revenue adequacy is achieved. In addition, decision makers also need to consider whether or not the railroads would be able to achieve such large increases in the face of strong competition in many of the markets that they serve.

The application of a multiple indicator approach, while appealing because it permits a broad analysis of each railroad's financial condition, appears unlikely to yield satisfactory or equitable results. As our review revealed, there appears to be no widespread agreement regarding (1) which indicators to use, (2) what standards to apply in evaluating the indicators, or (3) how to weight the results. Since it appears likely that, as occurred in 1984, railroads will perform well on some indicators and poorly on others, the Commission will be left to exercise judgment in interpreting the results. While it can be argued that ICC exists to exercise just this kind of judgment, with a multi-person commission, the deciding criteria could shift from year-to-year. The result could be that a particular railroad would be found revenue adequate 1 year based on one set of criteria and revenue inadequate the following year based on a different set of criteria. This outcome would appear to be inequitable to both the railroads and the shippers.

Existing and traditional approaches--important similarities and key differences

ICC's existing approach and the traditional approach possess important similarities that argue for the adoption of a method that incorporates their basic underpinnings. Both methods use a generally accepted regulatory and economic approach for measuring the profitability of a regulated firm--the comparison of ROI with the cost of capital. The approaches also use reported financial data and can provide unambiguous results. On the other hand, they are marked by key differences that will need to be resolved before a final method is selected.

One key difference is the accounting method used to report the income and asset information used to calculate ROI. Adoption of depreciation accounting for revenue adequacy purposes appears superior to the continued use of RRB accounting. The use of depreciation accounting would make the revenue adequacy determinations consistent with not only ICC's overall financial reporting requirements but also with the accounting methods used in other comparable industries. If depreciation accounting was adopted, however, the problems with predecessor costs and the write-up of the asset base would need to be addressed.

Solving the predecessor cost issue appears relatively easy. Since the Commission has supported its existing revenue adequacy approach on the grounds that it is market oriented, we would expect ICC, if it adopted depreciation accounting, to use financial data that reflected the values market transactions had assigned to railroad assets and not the predecessor costs.

The problem of the write-up of the asset base appears more intractable. Arguably, rail shippers should not have to pay twice for expenses designed to recover the deterioration of track and structures. However, the conceptual differences between RRB and depreciation accounting and the lack of sufficient current information make it difficult to determine if the railroads have been, in fact, recovering the disputed expenses twice. The Railroad Accounting Principles Board is currently addressing this issue and the results of its work should provide further data on which a decision can be made.

Another key difference is how the two approaches determine the cost of capital, in particular, the treatment of deferred taxes and the appropriate measure of the cost of debt. The evidence that we have developed suggests that the method used to measure revenue adequacy should reflect the existence of deferred taxes. Deferred taxes represent an important source of capital to the railroad industry that has been used to improve the industry's asset base. Regulators of other industries recognize deferred taxes as a "zero-interest" source of capital and adjust for it. The argument that adjusting for deferred taxes will reduce the railroad's incentive to invest in the industry appears spurious. These funds have been created by differences in the way rates are set and the tax laws administered. As such, they are funds derived from sources other than the railroads' owners or creditors; therefore, the return the railroads earn on the application of these funds would appear to provide an adequate incentive for their use.

Which measure of the cost of debt decision makers select will depend ultimately on the economic perspective they apply in determining revenue adequacy. If on the one hand, revenue adequacy is viewed, as the railroads currently do, as a forward-looking concept that measures the opportunity costs of obtaining capital, then the current cost of debt would appear to be the most appropriate solution. If on the other hand, revenue adequacy is designed to measure the revenues railroads need to service their past and present debt, then the embedded cost of debt should be adopted.

SECTION 2

BACKGROUND

REVENUE ADEQUACY WAS FIRST INTRODUCED IN THE 4R ACT

--THE 4R ACT DIRECTED ICC TO DEVELOP STANDARDS FOR ESTABLISHING REVENUE LEVELS ADEQUATE TO COVER OPERATING EXPENSES PLUS A REASONABLE RETURN ON CAPITAL.

--UNDER THE 4R ACT, ADEQUATE REVENUES SHOULD

- PROVIDE A FLOW OF NET INCOME PLUS DEPRECIATION ADEQUATE TO SUPPORT PRUDENT CAPITAL OUTLAYS,
- ASSURE REPAYMENT OF A REASONABLE LEVEL OF DEBT, AND
- PERMIT THE RAISING OF NEEDED EQUITY CAPITAL.

--THE 4R ACT DID NOT DIRECTLY LINK REVENUE ADEQUACY TO ICC'S REGULATORY PROCESS.

REVENUE ADEQUACY WAS FIRST INTRODUCED IN THE 4R ACT

The concept of revenue adequacy was first introduced in the 4R Act. The act was designed to provide a means to rehabilitate and maintain the physical facilities and restore the financial stability of the nation's railroad system. To carry out these objectives, the Congress, among other things, directed ICC to

> "develop and promulgate (and thereafter revise and maintain) reasonable standards and procedures for the establishment of revenue levels adequate under honest, economical, and efficient management to cover total operating expenses, including depreciation and obsolescence, plus a fair, reasonable, and economic profit or return (or both) on capital employed in the business."

Section 205 of the 4R Act went on to specify that adequate revenue levels should

- --provide a flow of net income plus depreciation adequate to support prudent capital outlays,
- --assure repayment of a reasonable level of debt,
- --permit the raising of needed equity capital,
- --cover the effects of inflation, and
- --ensure retention and attraction of capital adequate to provide a sound transportation system.

Although the 4R Act did not directly link revenue adequacy to ICC's regulatory process, it did include a general statement that ICC should make an adequate and continuing effort to assist the railroads in attaining adequate revenues.

STAGGERS RAIL ACT INCREASED THE IMPORTANCE OF REVENUE ADEQUACY

--THE MAJOR GOAL OF THE STAGGERS RAIL ACT WAS TO IMPROVE AND MAINTAIN THE RAILROADS' PHYSICAL AND FINANCIAL HEALTH.

--THE STAGGERS RAIL ACT REQUIRED ICC TO MAKE ANNUAL REVENUE ADEQUACY DETERMINATIONS.

--THE STAGGERS RAIL ACT LINKED ICC'S REVENUE ADEQUACY DETERMINATIONS TO THE REGULATORY PROCESS.

- IN CONSIDERING THE REASONABLENESS OF RATES ON MARKET DOMINANT TRAFFIC, THE ACT DIRECTED ICC TO RECOGNIZE THAT RAILROADS SHOULD EARN ADEQUATE REVENUES.
- RAILROADS THAT WERE REVENUE INADEQUATE WERE ALSO GIVEN LIMITED RATE-SETTING FREEDOM.

STAGGERS RAIL ACT INCREASED THE IMPORTANCE OF REVENUE ADEQUACY

Passed only 5 years after the 4R Act, the Staggers Rail Act modified the Interstate Commerce Act in several ways that increased the importance of revenue adequacy. First, the Staggers Rail Act reemphasized the importance of improving the railroads' financial health by making the "restoration, maintenance, and improvement of the physical facilities and financial stability" of the railroads a primary goal. The Staggers Rail Act also underlined this goal by adopting a national rail transportation policy that included as one of its elements a requirement that railroads be allowed to earn adequate revenues. The Congress saw this goal being achieved primarily through the use of competition rather than through regulation; however, concerned about the railroads' residual market power, the Congress did direct the continuation of a regulatory process that balanced the needs of the railroads, the shippers, and the public.

Second, the Staggers Rail Act changed ICC's revenue adequacy determination from an optional exercise to an annual requirement. While ICC issued only one revenue adequacy determination between 1976 and 1980, the Staggers Rail Act required the ICC to determine which railroads were revenue adequate within 180 days after the act's passage and to make annual determinations in future years.

Finally, the Staggers Rail Act linked ICC's revenue adequacy determinations to the regulatory process. Reflecting Congress' preference for competition over regulation, the Staggers Rail Act limited ICC's jurisdiction over rail rates to instances where the Commission found that the railroad had "market dominance" over the traffic to which the rate applied. In judging the reasonableness of rates on market dominant traffic, however, the Staggers Rail Act directed the Commission to explicitly recognize the act's policy that railroads should earn adequate revenues.

The act also provided limited rate-making freedom to revenue inadequate railroads. Specifically, revenue inadequate railroads are allowed to increase rates within a "zone of rate flexibility" on market dominant traffic--situations where the railroads have no effective competition. These increases, which can be equal to the ICC-determined inflation in rail costs plus 4 percent, may not be suspended, although they may be protested by shippers. The act also allows revenue inadequate railroads to impose surcharges on certain light-density rail lines--rail lines that carry small amounts of traffic.

ICC'S STANDARD FOR REVENUE ADEQUACY

--UNDER THE 4R ACT ICC USED A MULTIPLE INDICATOR APPROACH TO MEASURE REVENUE ADEQUACY.

--AFTER THE STAGGERS RAIL ACT WAS PASSED, ICC REVISED ITS APPROACH AND ADOPTED A NEW SINGLE STANDARD.

--UNDER ICC'S EXISTING STANDARD, RAILROADS WITH AN ROI GREATER THAN OR EQUAL TO THE CURRENT COST OF CAPITAL ARE CONSIDERED REVENUE ADEQUATE.

--SINCE ICC ADOPTED THIS STANDARD, IT HAS FOUND A LIMITED NUMBER OF RAILROADS TO BE REVENUE ADEQUATE.

Table 2.1
ICC Revenue Adequacy Determinations

Year	ICC cost of capital determination	Number of revenue adequate railroads
	(percent)	
1979	11.0	3
1980	11.7	3
1981	16.5	2
1982	17.7	0
1983	15.3	0
1984	15.8	0

Source: ICC.

ICC'S STANDARD FOR REVENUE ADEQUACY

ICC has employed two standards for measuring railroad revenue adequacy. In January 1978, ICC adopted Ex Parte 338, Standards and Procedures for the Establishment of Adequate Railroad Revenue Levels. In this proceeding, ICC selected three measures to determine railroad revenue adequacy:

--ROI equal to the cost of capital.

--Various financial ratios intended to measure a railroad's financial condition.

--A funds flow model designed to determine if net income was adequate to support a railroad's capital needs.

Using this approach, ICC made one revenue adequacy determination in December 1979 and found that for 1978, 13 of the 35 Class I railroads (excluding Conrail) were revenue adequate while 22 railroads were revenue inadequate.

After the Staggers Rail Act was passed in October 1980, ICC revised its revenue adequacy standards and, in March 1981, adopted a single standard based on ROI equal to the current cost of capital. ICC offered two primary reasons for adopting this standard.

First, ICC took note of the linkage between revenue adequacy and the additional rate flexibility provided by the Staggers Rail Act. ICC stated that it did not want to select an indicator that would inappropriately deny the railroads the flexibility provided by the act. The Commission felt that the financial ratios and funds flow model were appropriate only as short-term indicators of railroad financial viability and that their use could prevent the railroads from achieving the long-term revenue adequacy called for by the Staggers Rail Act.

Second, ICC believed that an ROI equal to the current cost of capital was the minimum necessary to attract and maintain capital in the railroad industry. In the Commission's view, railroads should be given the opportunity to earn a return comparable to other investment opportunities. The Commission pointed out, however, that it was not guaranteeing the railroads a return equal to the cost of capital.

After adopting this standard, ICC used 1979 data and found only three small railroads--the Bessemer & Lake Erie, the Elgin, Joliet & Eastern, and the Fort Worth & Denver--revenue adequate. ICC has never found a major Class I railroad revenue adequate and since 1982, ICC has not found any railroad revenue adequate.

ICC'S STANDARD FOR MEASURING REVENUE ADEQUACY HAS COME UNDER SCRUTINY FROM VARIOUS GROUPS

--AFTER COMPARING RECENT IMPROVEMENTS IN THE FINANCIAL HEALTH OF THE NATION'S LARGEST RAILROADS WITH ICC'S REVENUE ADEQUACY DETERMINATIONS, SHIPPER ORGANIZATIONS HAVE QUESTIONED THE VALIDITY OF ICC'S EXISTING STANDARD.

--THE RAILROAD ACCOUNTING PRINCIPLES BOARD IS REVIEWING ICC'S APPROACH AS PART OF ITS MANDATE UNDER THE STAGGERS RAIL ACT TO ESTABLISH RAILROAD COST ACCOUNTING PRINCIPLES.

--STUDIES HAVE BEEN PREPARED TO DETERMINE IF ANY RAILROADS WOULD BE REVENUE ADEQUATE IF ALTERNATIVE APPROACHES ARE USED. THESE STUDIES HAVE SHOWN CONFLICTING RESULTS.

--ICC HAS RESPONDED TO THIS SCRUTINY BY INDICATING THAT IT WILL REEVALUATE ITS APPROACH FOR MEASURING REVENUE ADEQUACY.

ICC'S STANDARD FOR MEASURING REVENUE ADEQUACY HAS COME UNDER SCRUTINY FROM VARIOUS GROUPS

In recent years, ICC's method for determining railroad revenue adequacy has come under scrutiny by various groups, including the Commission itself.

After comparing improvements in the financial health of the nation's largest railroads with ICC's revenue adequacy determinations, individual shippers, shipper trade associations, and the National Association of Regulatory Utility Commissioners have asked whether ICC is measuring revenue adequacy correctly. These groups have criticized ICC's methodology for determining the cost of capital and calculating ROI. These groups have also asked whether other indicators of financial health, in addition to ROI, should be used to measure revenue adequacy.

Scrutiny of ICC's approach has also come from organizations outside the shipping community. The Railroad Accounting Principles Board is currently reviewing how ICC determines ROI and the cost of capital, as part of its mandate under the Staggers Rail Act, to establish cost accounting principles for the railroad industry. ICC's method for determining revenue adequacy has also been criticized by members of Congress during recent hearings on ICC activities.

Some groups have prepared studies to illustrate the impact of using alternative methods for measuring revenue adequacy. For example, the Edison Electric Institute, a trade association for investor-owned electric utilities, prepared a study in November 1985 indicating that, under a certain set of assumptions, several of the nation's largest railroads would have been considered revenue adequate in 1984. In contrast, the Association of American Railroads--the railroads' trade association--prepared a study in December 1985 using an approach that it believed reflected the major criticisms of ICC's methodology. According to the study, none of the 12 major Class I railroads would have been considered revenue adequate from 1980 to 1984.

ICC has responded to this criticism by indicating that it intended to reevaluate its approach for measuring revenue adequacy. In February 1986 hearings before the Subcommittee on Surface Transportation, Senate Committee on Commerce, Science, and Transportation, the Chairman, ICC, acknowledged that ICC's existing standards and procedures were not producing a realistic picture of the financial condition of the rail industry and that the Commission was beginning an internal evaluation of the criticisms of its existing approach. Subsequently, in its May 1, 1986, decision in Ex Parte 463, Railroad Revenue Adequacy - 1984 Determination, ICC stated that it would issue a notice requesting public comment on a "broad range of issues" dealing with revenue adequacy. Finally, on May 30, 1986, ICC issued a formal notice requesting public comment on proposed revisions to its existing method for determining revenue adequacy. These revisions involve the methods ICC uses to calculate ROI and determine the cost of capital. The proposed revisions, if adopted, would result in ICC using a method for measuring revenue adequacy that is very similar to the traditional method discussed in section 4.

BLANK PAGE

THE PRACTICAL IMPACT OF ICC'S REVENUE ADEQUACY FINDINGS IS NOT CLEAR

--REVENUE INADEQUATE RAILROADS HAVE MADE LITTLE USE OF THE LIMITED RATE-SETTING FREEDOMS PROVIDED BY THE STAGGERS RAIL ACT.

--THE ACT REQUIRES ICC TO CONSIDER REVENUE ADEQUACY WHEN REVIEWING THE REASONABLENESS OF RATES ON MARKET DOMINANT TRAFFIC.

--ACCORDING TO ICC DATA, POTENTIALLY MARKET DOMINANT TRAFFIC MAY ACCOUNT FOR ABOUT 25 PERCENT OF THE RAILROADS' BUSINESS.

--IN ESTABLISHING STANDARDS FOR REVIEWING THE REASONABLENESS OF RATES ON MARKET DOMINANT TRAFFIC, ICC HAS STATED THAT IT WILL TAKE A RAILROAD'S REVENUE ADEQUACY INTO ACCOUNT.

--IN MAY 1986, ICC STATED THAT IN RATE CASES IT WOULD NOT CONSIDER ITS OWN REVENUE ADEQUACY DETERMINATIONS CONCLUSIVE, BUT WOULD ALLOW COMPLAINANTS TO SUBMIT NEW EVIDENCE ON REVENUE ADEQUACY.

THE PRACTICAL IMPACT OF ICC'S REVENUE ADEQUACY FINDINGS IS NOT CLEAR

Although ICC has not found any railroad revenue adequate since 1982, it is not clear what impact the Commission's findings have had on railroad rate-setting practices. Revenue inadequate railroads gain limited rate-setting freedom within a "zone of rate flexibility" and on light-density rail lines. ICC has not collected data on the number of tariffs filed under the zone of rate flexibility and light-density surcharge provisions of the Staggers Rail Act; however, Commission officials believe that the railroads have not made extensive use of these provisions.

Railroad revenue adequacy can also play a role in ICC decisions on the reasonableness of rail rates on market dominant traffic. The Staggers Rail Act directs ICC, when it decides on the reasonableness of rates, to recognize the act's policy that railroads should earn adequate revenues. The practical impact of ICC's revenue adequacy decisions in rate reasonableness cases may be limited by two factors.

First, under the Staggers Rail Act, ICC's jurisdiction is limited to rates where the railroads are found to have market dominance. To determine market dominance, ICC initially compares the revenue-to-variable-cost percentage of the rate in question to a threshold level established by the Staggers Rail Act. This level is currently 180 percent. ICC has jurisdiction only where the revenue-to-variable-cost percentage is above this level. Railroads have complete rate-setting freedom below this level.

According to data drawn from a 1983 ICC study of rail freight revenues and costs, the most recent data available, only about 25 percent of the railroads' business is operating above the 180 percent revenue-to-variable-cost threshold. This estimate includes traffic moving under private contracts between the railroads and the shippers. Although under the Staggers Rail Act these contracts are subject to ICC approval, ICC does not have jurisdiction over rates agreed to by railroads and shippers in contracts. Consequently, the amount of traffic subject to ICC's jurisdiction could be less than 25 percent of the railroads' business.

Second, ICC's recent revenue adequacy decision may also limit the practical impact of ICC's revenue adequacy determinations. In response to the act's requirement that it consider the railroads' revenue adequacy when reviewing the reasonableness of rates, ICC included a revenue adequacy constraint in its September 1985, decision Coal Rate Guidelines, Nationwide. Under this constraint, ICC has stated that shippers should not be required to pay more than is necessary to make a railroad revenue adequate. According to officials in ICC's Bureau of Accounts, this constraint means that if a railroad is found to be revenue adequate, ICC will look less favorably on proposed rate increases.

While ICC had intended to use its annual revenue adequacy determinations in judging rate reasonableness, in its May 1986 decision on the railroads' 1984 revenue adequacy, ICC stated that because of concerns about the validity of its findings, it would not "treat the findings made under our current methodology as determinative or conclusive" of revenue adequacy. ICC stated that in a rate case it would accept all evidence relevant to a railroad's revenue adequacy, including various financial indicators or measurements, and that it would then decide revenue adequacy on a case-by-case basis.

SECTION 3

TRENDS IN RAILROAD FINANCIAL INDICATORS

TRENDS IN RAILROAD FINANCIAL INDICATORS--AN OVERVIEW

Improving the railroads' financial and operational health was a key goal of the Staggers Rail Act. Shippers, and their trade associations have based some of their criticism of ICC's existing method for determining revenue adequacy on a comparison of ICC's finding that no railroad is revenue adequate with the views of financial analysts that railroad financial health has improved. To provide perspective on this criticism, this section contains information on recent trends in financial and operational indicators for all of the nation's Class I railroads. Data on individual railroads are contained in appendix IV. This section also compares the overall performance of the railroads with comparable industries for selected financial indicators.

While accounting changes ICC made in 1983 complicate time series analysis, overall, recent trends in railroad financial indicators provide a mixed picture of railroad financial health. On the positive side,

--returns on equity and investment, while modest, have increased;

--railroads appear more able to service their debt load, which has assumed a lower proportion of total capital; and

--railroad cash flow has increased, owing in large part to the benefits provided by the Economic Recovery Tax Act of 1981.

Indicating a more guarded picture, however,

--returns are still below the ICC determined cost of capital;

--the railroads' operating ratio, a measure of efficiency, is still above 85 percent; and

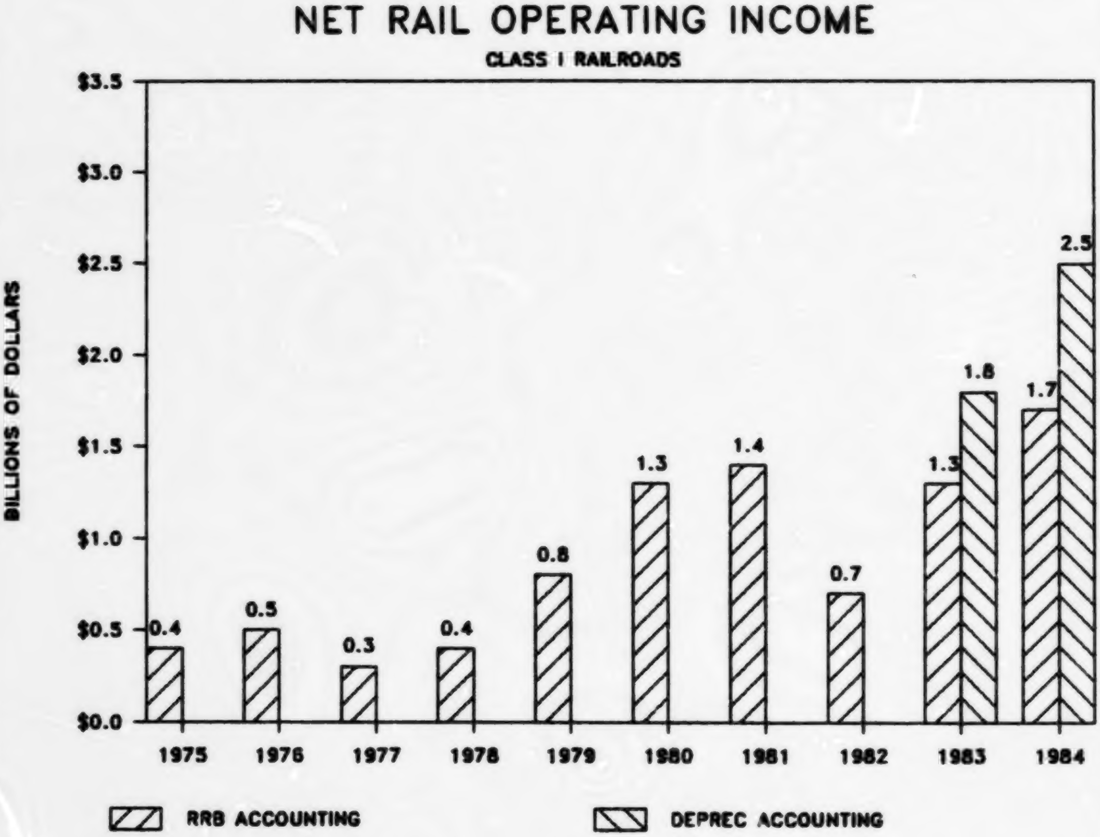
--discretionary cash flow recorded only its second positive year in the last decade in 1984.

The railroads spent over $14.9 billion from 1980 to 1984 on capital expenditures. The majority of these funds have gone into the improvement of track and facilities, with rolling stock expenditures having declined following the development of an oversupply in the late 1970's. At the same time, railroads have continued to abandon facilities and rolling stock they believe no longer able to produce an adequate return. Funds for these capital expenditures have come primarily from cash flow and specialized equipment borrowings known as Equipment Trust Certificates and Conditional Sales Agreements.

While the railroads, during 1984, lagged behind such industries as trucking, electric utility, and natural gas pipeline in terms of their return on equity, they did experience comparable performance on financial indicators designed to measure the ability to repay debt.

BLANK PAGE

Figure 3.1



SOURCE: ASSOCIATION OF AMERICAN RAILROADS

NET RAIL OPERATING INCOME HAS INCREASED

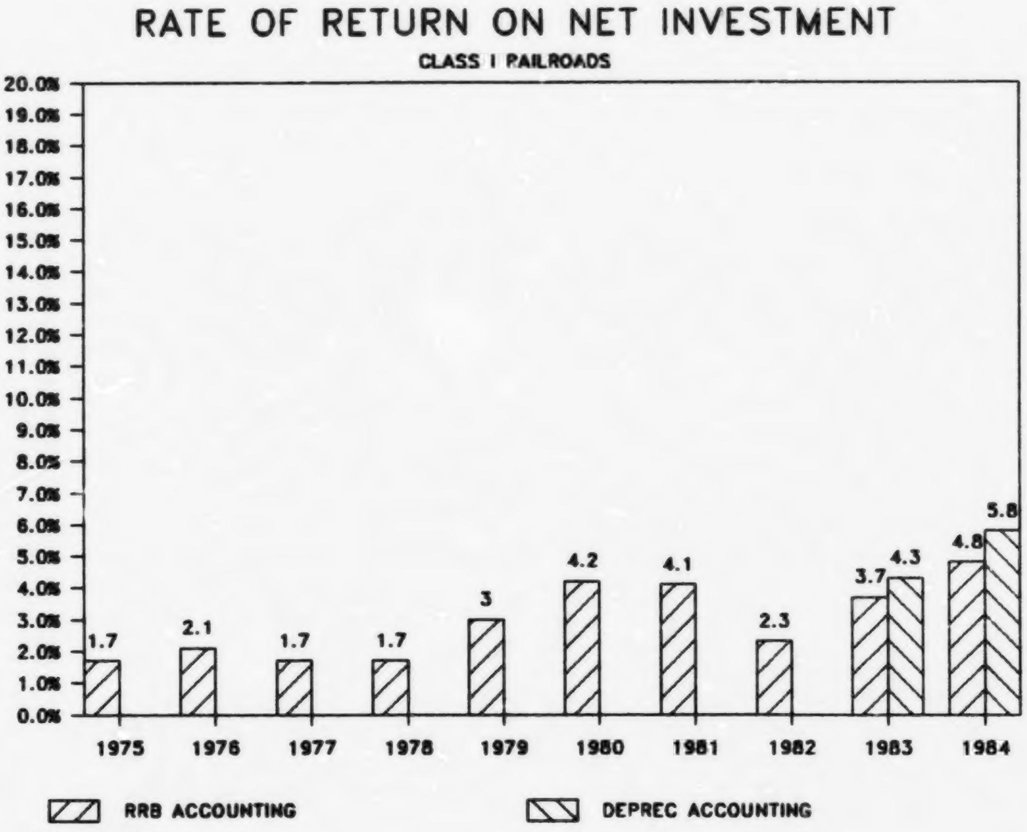
Net rail operating income increased from $1.3 billion in 1980 to $2.5 billion in 1984. Net rail operating income represents operating revenues less operating expenses, current and deferred taxes, and other various expenses, and does not include nonoperating income. Fixed charges normally are not deducted from the net rail operating income. Two reasons account for the increase in the net rail operating income--changes in railroad accounting requirements and trends in expenses and revenues.

ICC's change from RRB accounting to depreciation accounting in 1983 was a primary cause for the recent increase in net rail operating income. Although ICC changed the accounting procedure strictly for regulatory financial reporting purposes, this change produced a net reduction in the railroads' expenses and, as a result, improved net income. Because this change made the data for 1983 and 1984 not comparable to data for prior years, we have reported those years' net rail operating income on the basis of RRB accounting for the purpose of comparison. Figure 3.1 shows that net rail operating income has improved in recent years even under the RRB accounting system. (See app. I for a comparison of depreciation and RRB accounting.)

The industry's net rail operating income has also benefitted from a slight increase in operating revenues and a flattening-out of operating expenses. Operating revenues increased a total of 5 percent from 1980 to 1984 (from $28.1 billion to $29.5 billion). Under the RRB system, expenses decreased from 1981 to 1982 (by 7 percent) after steadily increasing during the 1970's. Under depreciation accounting, the industry saw an increase of 7 percent in expenses from 1983 to 1984 (from $24.1 billion to $25.8 billion).

Industry analysts believe that several factors contributed to improvements in operating expenses. Labor is one factor. From 1980 to 1984, rail employment decreased 30 percent, from 458,994 employees to 323,030 employees. During that same period, earnings per employee increased by 38 percent, after taking inflation into account. A second factor is the increase in abandonments. The Staggers Rail Act made abandonments by railroads easier and the railroads took advantage of this provision to streamline their systems. From 1980 to 1984, railroads abandoned 12,529 miles of track. These shifts are believed to have helped to mitigate increasing operating expenses in other areas.

Figure 3.2



SOURCE: ICC

ROI HAS IMPROVED

ROI for the nation's Class I railroads (calculated on an RRB accounting basis) has averaged 3.8 percent since 1980, an improvement over the 2.0 percent average for the period of 1975-79; however, ROI has not reached the cost of capital determined annually by ICC since 1978.

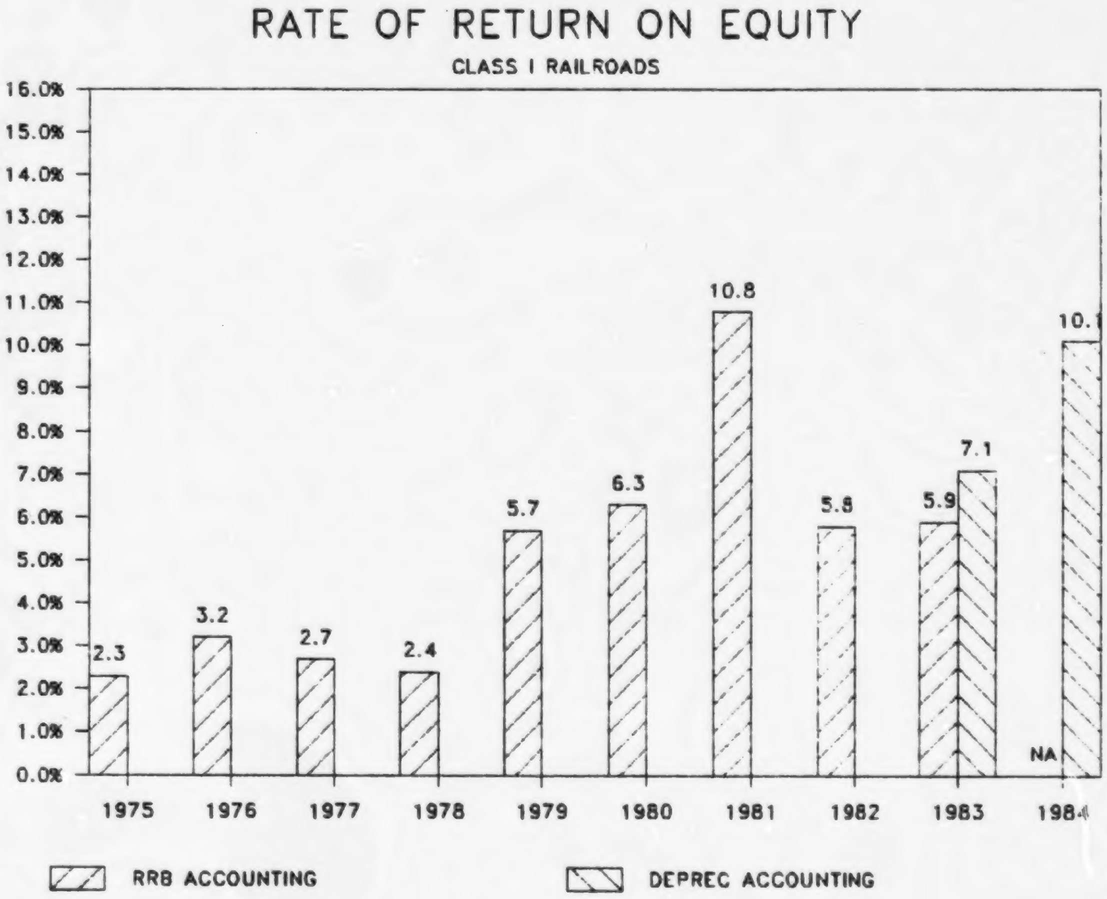
ICC considers ROI as the most important financial ratio in its analysis of the railroad industry. ROI measures income generated from the operation of the railroad against the funds invested in the road, equipment, and working capital used to generate the operating income.

Table 3.1
ICC Determined Cost of Captial

Year	Cost of capital (percent)
1978	10.6
1979	11.0
1980	11.2
1981	16.5
1982	17.7
1983	15.3
1984	15.8

Source: ICC.

Figure 3.3



SOURCE: ICC

RETURN ON EQUITY HAS ALSO IMPROVED

Due to accounting changes, the rail industry's return on equity after 1982 is not strictly comparable to returns reported in prior years; however, return on equity has shown improvement similar to that of ROI. On a depreciation accounting basis, return on equity increased from 7.1 percent in 1983 to 10.1 percent in 1984.

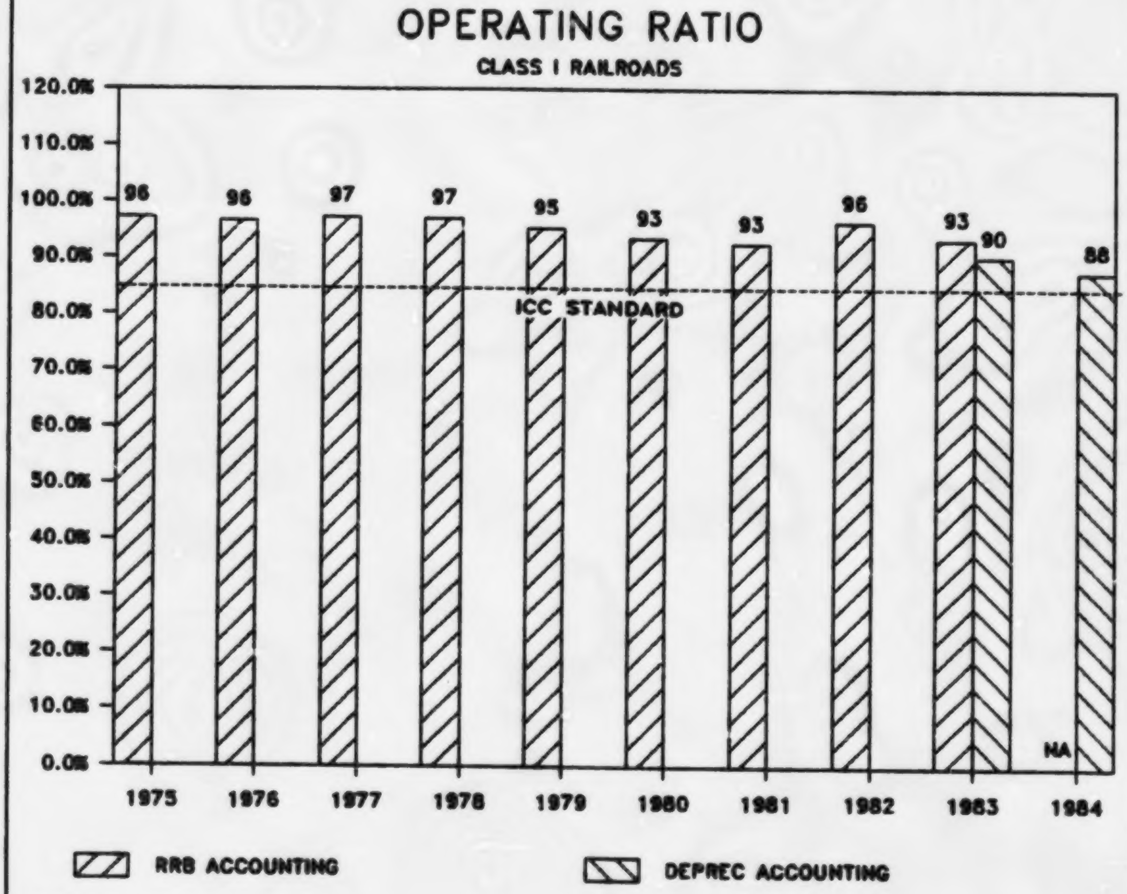
Return on equity measures the percentage profit realized by the railroads' shareholders by comparing net income after taxes to the total book value of the shareholders' investment in the railroad. It is calculated by dividing net income by the average of the beginning and end of year shareholders' equity. ICC uses the cost of equity capital as the benchmark for evaluating return on equity. The industry's return on equity has not reached the cost of equity capital determined annually by ICC since 1978.

Table 3.2
ICC Determined Cost of Equity Capital

Year	Cost of equity capital
	(percent)
1978	13.0
1979	13.5
1980	13.5
1981	18.3
1982	19.8
1983	16.8
1984	17.3

Source: ICC.

Figure 3.4



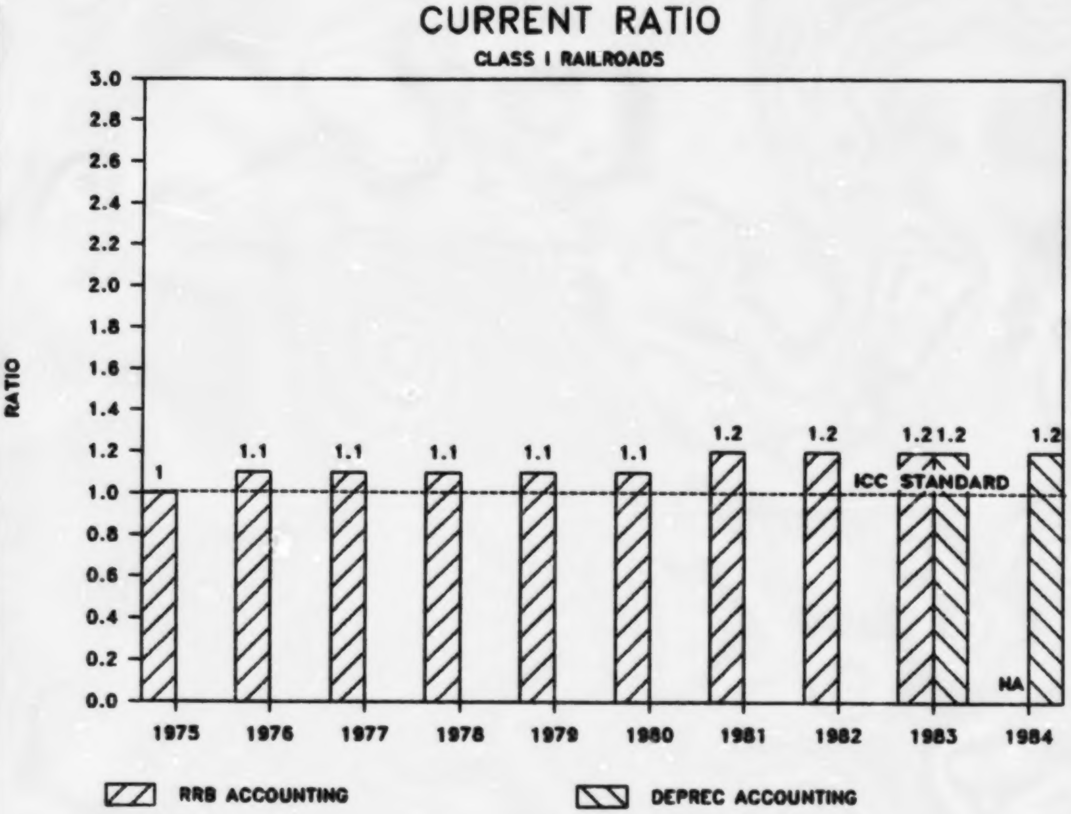
SOURCE: ICC

RAILROAD OPERATING RATIO HAS DECLINED

The operating ratio is the relationship between operating expenses and operating revenues. Calculated by dividing railway operating expenses by railway operating revenues, the operating ratio is used as a measurement of the efficiency of railroad operations. The lower the operating ratio the more efficient are a railroad's actual operations. While no definitive study has been developed to determine a satisfactory operating ratio, ICC has traditionally used an 85 percent guideline for a satisfactory operating ratio.

Like other financial ratios, the operating ratio was affected by the accounting change made in 1983. Therefore, the operating ratios for 1983 and 1984, which are based on depreciation accounting, are not comparable to those of prior years, which are based on RRB accounting. However, we were able to calculate a 1983 operating ratio on an RRB basis. Figure 3.4 shows that, regardless of the accounting method used, the industry's overall operating ratio has declined slightly since 1975, indicating that the industry's operations have become more efficient.

Figure 3.5



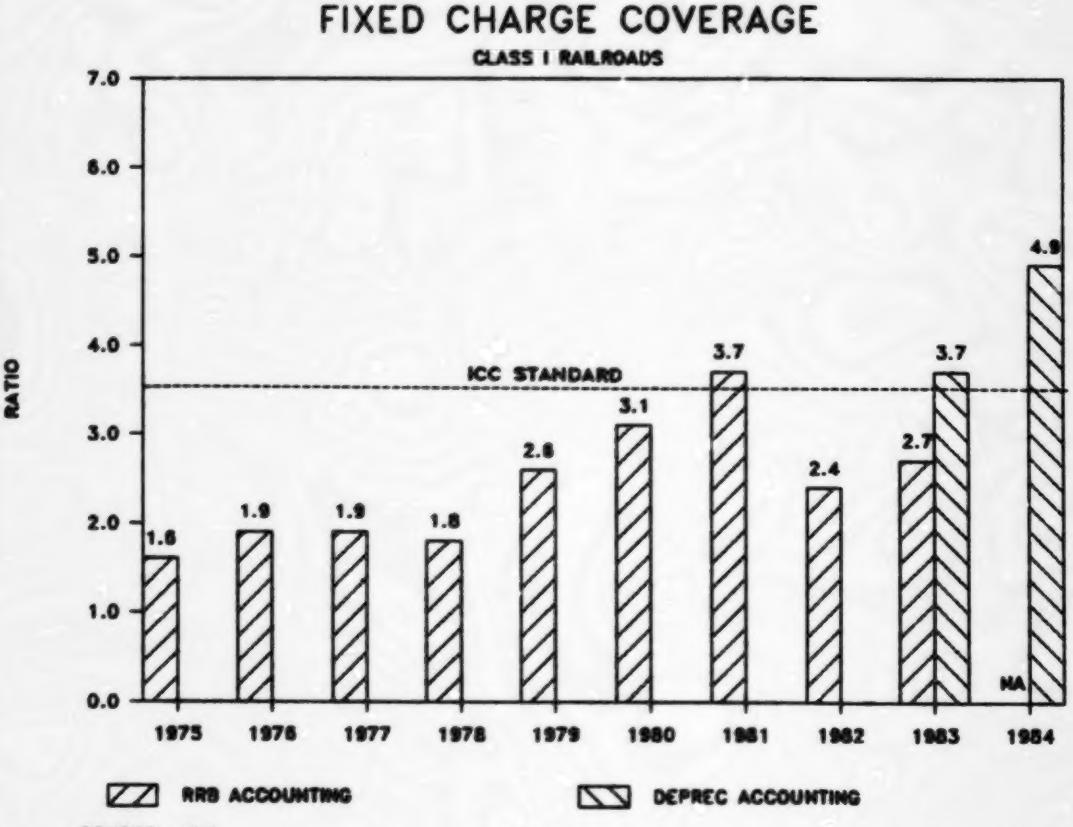
SOURCE: ICC

RAILROADS' ABILITY TO REPAY CURRENT DEBT HAS IMPROVED

The current ratio measures the ability of a railroad to repay its current or short-term obligations out of funds from cash and material accounts. The current ratio is calculated by dividing total current assets by total current liabilities. ICC has determined that a current ratio greater than 1.0 normally signifies the ability to cover current obligations. A railroad, however, could have a current ratio less than 1.0, if its holding company rather than the railroad retains its excess cash.

The industry has been able to maintain a healthy and slightly increasing current ratio over the last decade. Because of the change in accounting methods, the ratios for 1983 and 1984 are not comparable to those of prior years.

Figure 3.6



SOURCE: ICC

RAILROADS' ABILITY TO PAY INTEREST ON OUTSTANDING DEBT HAS IMPROVED

The fixed and contingent charge coverage ratio is derived by dividing the total fixed and contingent charge by income available for fixed charges. This ratio measures the ability of a railroad to make interest payments on outstanding debt from income generated during the year. ICC has considered a fixed charge coverage ratio greater than 3.5 to be satisfactory, although some financial analysts consider 2.5 to be sufficient.

Figure 3.6 shows fluctuation in the industry's fixed charge coverage ratio for the past decade. Under the RRB accounting method, the industry succeeded in surpassing ICC's benchmark only for 1981. The ratios for 1983 and 1984, both calculated using the depreciation method, are satisfactory and suggest an improvement in 1984 in the railroads' ability to make interest payments on debt.

Table 3.3
Major Class I
Railroad Bond Ratings

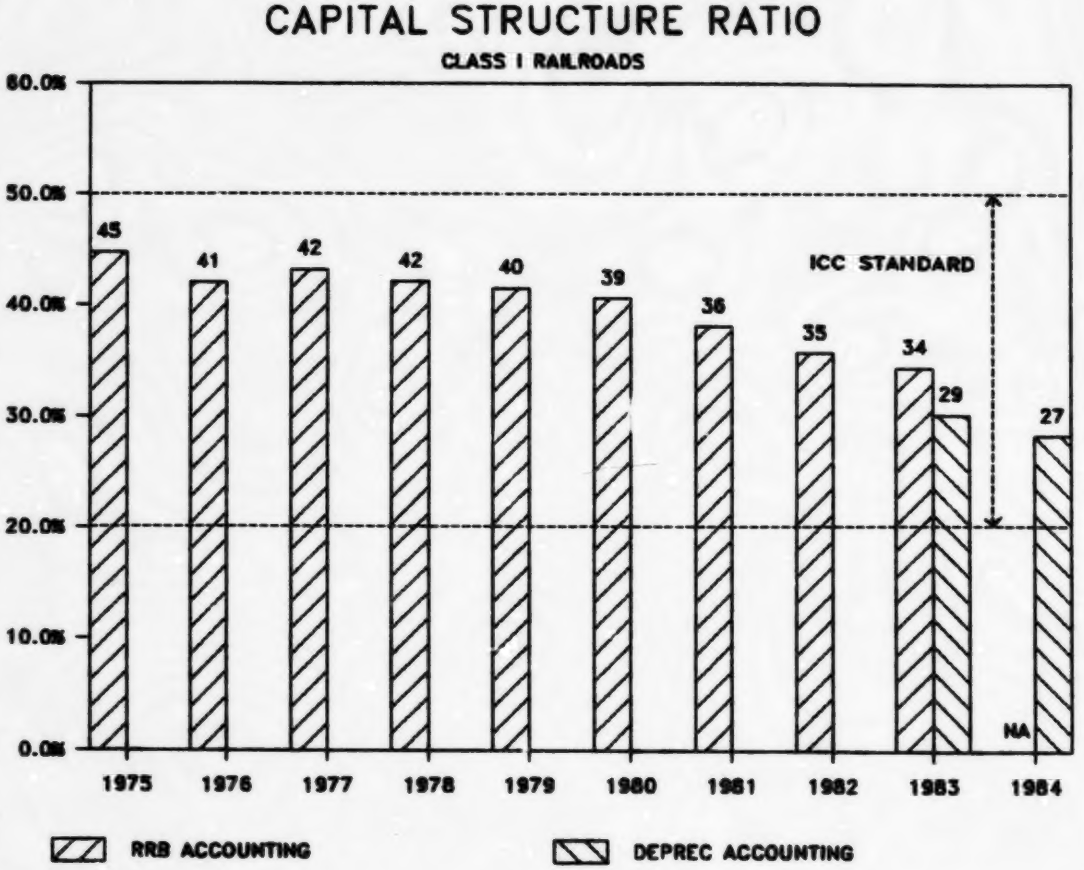
Major Class I railroads	1980	1981	1982	1983	1984
Baltimore & Ohio	BBB	BBB	BBB	A+	A+
Chesapeake & Ohio	A	A	A	A+	A+
Seaboard	A	A	A	A	A+
Burlington Northern	A	A	A	A	AA
Union Pacific	AA	AA	AA	AA	AA
Missouri Pacific	A-	A-	A-	AA	AA
Western Pacific	BB	BB	BB	AA	AA
Norfolk & Western	AA	AA	AA	AA	AA
Southern	AA	AA	AA	AA	AA
Southern Pacific	A	A	BBB	BBB	BBB
St. Louis & Southwestern	AA	AA	AA	AA	AA
Atchison, Topeka & Santa Fe	AA	AA	AA	AA	AA

Source: Standard & Poor's "Bond Guide."

RAILROAD BOND RATINGS HAVE GENERALLY IMPROVED

Standard and Poor's considers a bond rating of BBB or better to be investment grade. Investment grade bonds generally enjoy lower financing costs. The bond ratings of the major railroads, with the exception of the Southern Pacific, have remained the same or improved since 1980.

Figure 3.7



SOURCE: ICC

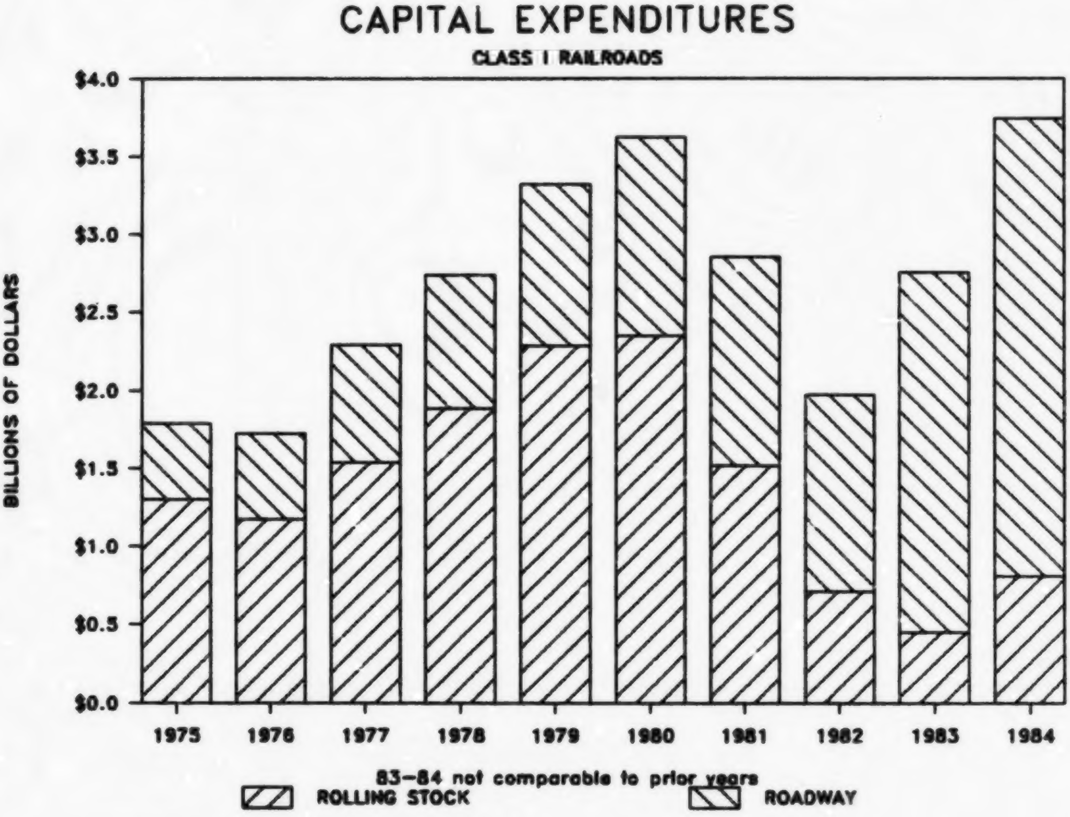
RAILROADS HAVE REDUCED THE AMOUNT OF DEBT IN THEIR CAPITAL STRUCTURE

The capital structure ratio measures the relationship of debt financing to the total amount of a railroad's debt and equity financing. This ratio is calculated by dividing total long-term debt by the sum of total long-term debt plus shareholders' equity.

ICC has assumed debt between 20 and 50 percent of total capital to be reasonable. A lower percentage of debt financing signifies the ability of a railroad to add additional debt--which usually is a lower cost method of financing capital improvements than selling equity.

Figure 3.7 indicates that the industry's overall capital structure ratio has steadily improved in the past decade, although the ratios calculated for 1983-84 cannot be compared with prior years' ratios because of changes in the accounting system. However, there has been an improvement between 1983-84, during which depreciation accounting was used.

Figure 3.8



SOURCE: ASSOCIATION OF AMERICAN RAILROADS

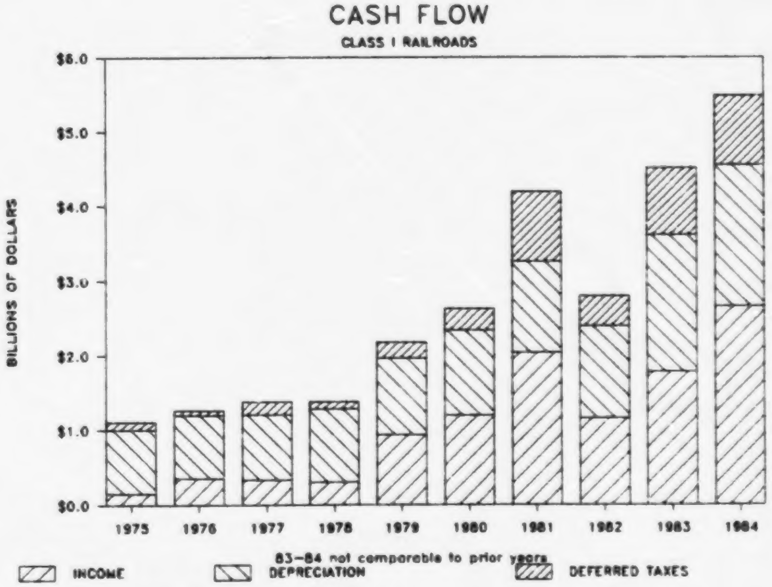
RAILROADS HAVE BEEN INVESTING IN MAINTAINING AND UPGRADING THEIR FACILITIES

The railroads are a mature industry. Consequently, their primary capital needs are for the maintenance of their track and structures and the replacement of old equipment with newer, more productive equipment. Meeting these needs, however, requires a significant amount of capital. Total capital expenditures averaged almost $3.0 billion annually from 1980 to 1984.

Since 1975, the composition of capital expenditures has shifted. Through 1980, the major portion of total capital expenditures was for rolling stock. From 1981 to 1983, however, this type of expenditure declined significantly, owing to a glut in railroad cars. The year 1984 showed an upswing in rolling stock expenditures--a 77-percent increase over that of 1983. This reflected an effort by certain railroads to improve their systems by purchasing more technologically advanced locomotives and other specialized cars.

Since 1981, most of the capital expenditures have been for maintenance of roadway and structures. Eight financial analysts told us that the increase in roadway and structure expenditures was, in part, a result of abandonments and mergers--allowing railroads to concentrate maintenance efforts on their more viable lines. The $2.9 billion expended in 1984 represented an increase of 27 percent over 1983.

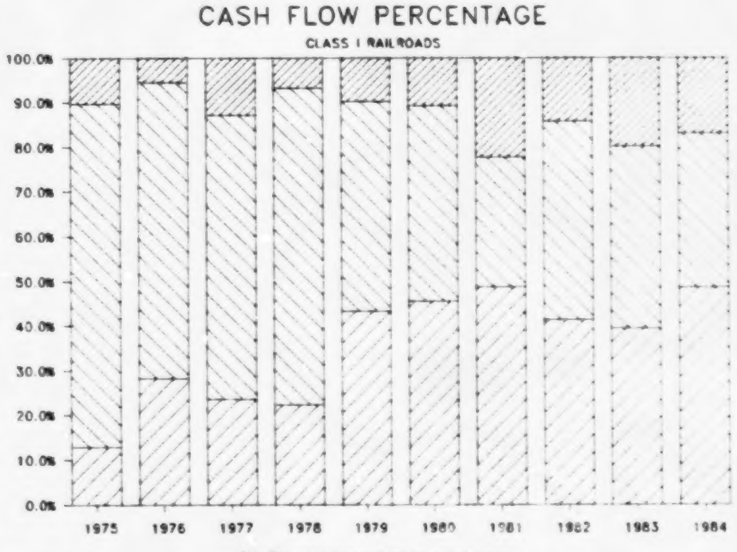
Figure 3.9



83-84 not comparable to prior years

SOURCE: ASSOCIATION OF AMERICAN RAILROADS

Figure 3.10



83-84 not comparable to prior years

SOURCE: ASSOCIATION OF AMERICAN RAILROADS

RAILROAD CAPITAL EXPENDITURES HAVE BEEN FINANCED PRIMARILY BY INTERNAL FUNDS

Changes in tax laws have increased the industry's cash flow since 1981, helping to make cash flow a major source of funds for railroad capital expenditures. ICC defines cash flow as the sum of net income, depreciation and amortization, and deferred taxes minus income from affiliated companies.[1]

The most significant impact on cash flow stemmed from provisions of the Economic Recovery Tax Act of 1981 (ERTA). ERTA permitted railroads to write off their total capitalized cost of track, which had not been depreciated under RRB accounting, during a period of 5 to 50 years, using a double-declining (accelerated) depreciation method. The period for depreciating rolling stock was also reduced to 5 years, and the cost of new additions and betterments was allowed to be depreciated over a 5-year recovery period. While these changes technically do not directly affect reported earnings, replacing taxes with deferred taxes substantially increases cash flow which can be used to reduce existing debt or offset future borrowing needs.

Since 1981, most railroads have been writing off their "frozen" asset base using an accelerated 5-year schedule for tax purposes. Because of these write-offs, the rail industry paid no federal taxes from 1981 through 1983. Instead, the industry received credits totalling $152 million. Cash generated from deferred taxes increased from $279 million in 1980 to $937 million in 1981. Although there was a decline in 1982, deferred taxes generated, on the average, $913 million annually in 1983 and 1984. After ERTA went into effect, deferred taxes constituted almost 20 percent of the industry's cash flow. Before ERTA, deferred taxes averaged less than 10 percent of the industry's cash flow. Most of the financial analysts we spoke with agreed that the write-off of the frozen asset base has had a direct impact on the improvement of the railroads financial health. Most railroads, however, will have written off their frozen asset bases by the end of this year, and their deferred taxes are likely to decrease.[2]

---

[1] This definition of cash flow is the generally accepted text book definition. Differences in calculating cash flow pertain to the inclusion or exclusion of certain accounts, such as sinking fund payments or serial debt payments such as Equipment Trust Certificates.

As noted earlier, in 1983, ICC adopted depreciation accounting for track structures. ICC's justification for this change was to more accurately recognize the decline in the usefulness of those assets over time, and hence reflect the truer economic costs of railroad service. This accounting change did increase reported earnings of the railroads by lowering reported maintenance-of-way expenses. This change also put the railroads in a much better position on their balance sheets and improved shareholders' equity.

Although recent increases in cash flow are important, some financial analysts we spoke with believe that cash flow alone may not provide an accurate picture of a railroad's cash situation. Two analysts we spoke with said that to obtain a more accurate picture of a railroad's cash flow position, they also examine the railroad's discretionary, or net, cash flow. While discretionary cash flow can be defined differently by different analysts, it roughly translates into cash flow after capital expenditures and other debt requirements have been met (including dividend payments).

Analysts believe that this value is important because it provides a nontraditional, short-term perspective on the firm's financial condition, especially if the firm is a mature industry like the railroads. The discretionary cash flow value may be used by the firm's management to determine ways to strengthen the firm, whether through stock buy-backs by the firm, higher dividends to stockowners, or investments in new technology. Although the industry's overall cash flow has increased steadily over the past decade, especially since ERTA, as show in table 3.4, discretionary cash flow has only begun to record positive values. According to one analyst, certain railroads should be able to maintain positive discretionary cash flow in subsequent years, without ERTA-type benefits, because they have sufficiently improved their overall business operations.

---

[2] While this report was being finalized, the Congress was considering legislation to change the nation's tax laws. Under the proposals being considered, accelerated depreciation for railroad structures and equipment would be retained; however, the years over which the structures and equipment would be depreciated would increase. A vice president of the Association of American Railroads told us that these changes could cost the railroad industry up to $1 billion in lost depreciation charges during the first 6 years the proposed legislation was effective. We, however, did not analyze the proposed tax legislation as part of this review.

Table 3.4

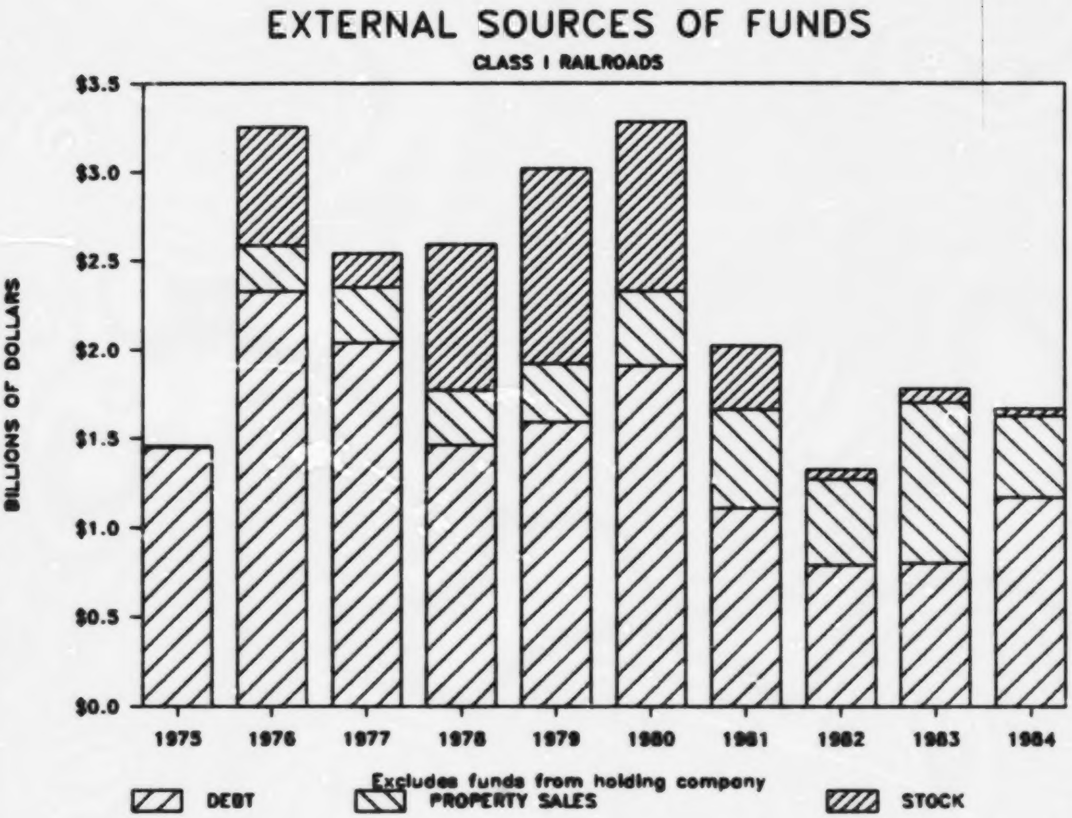
Discretionary cash flow-- Class I railroads

Year	Total amount
1975	($1,336,920)
1976	(1,421,779)
1977	(2,116,862)
1978	(1,772,165)
1979	(1,626,834)
1980	(1,556,705)
1981	475,024
1982	(114,129)
1983	(74,858)
1984	159,849

Source: ICC.

Note: This discretionary cash flow was obtained as follows: Income from operations + depreciation + deferred taxes + other sources (miscellaneous) - dividends paid - capital expenditures. Formula for deriving discretionary cash flow may vary between railroads.

Figure 3.11


EXTERNAL SOURCES OF FUNDS

CLASS I RAILROADS

Excludes funds from holding company

SOURCE: ICC

DEBT ISSUANCES HAVE BEEN A MAJOR SOURCE OF EXTERNAL FINANCING

Railroads have historically met a major portion of their external financing needs through debt issuances. Debt instruments are popular because they are less risky for investors. Moreover, debt financing is usually a lower cost method of financing capital improvements than selling equity. The primary forms of debt issuances have been Equipment Trust Certificates (ETCs) and Conditional Sales Agreements (CSAs).

ETCs and CSAs are debt obligations that are unique to the railroad industry and must be issued by the railroad, not by the railroad's holding company. ETCs and CSAs provide investors with a claim against specific rolling stock which is specially protected under section 1168 of the Bankruptcy Act. In the event of bankruptcy, not only does payment continue in a timely fashion, but equity also exists in the equipment, thereby minimizing the risk for the investors. This preferred status makes these financing instruments viable and popular.

Both ETCs and CSAs were developed as alternatives to stock offerings and mortgage bonds for the industry. There is no large secondary market for these instruments since investors typically hold them to maturity. ETCs and CSAs also are customarily noncallable; in other words, they mature serially, usually in a 10-15 year period, and have fixed-interest yields. ETCs are offered by competitive bid with the approval of ICC, and are not registered with the Securities and Exchange Commission. Title of ownership is passed when debt is repaid. CSAs do not need Securities and Exchange Commission approval and are privately placed. They are transactions between the railroad and the builder of the railroad equipment. Ownership by the railroad comes only after completion of payment and interest, done in installments.

The trend since 1980 among railroads has been to use internally generated cash to finance track and structure improvements and retire old debt and to use ETCs and CSAs to finance equipment. As shown in table 3.5, the overall debt level for the railroads, as a result, has been decreasing because railroads have been repaying debt faster than they have been generating it.

Table 3.5

Railroad Equipment Debt: 1980-84

Year	Outstanding at end of year (millions)
1980	$6,693.8
1981	6,142.7
1982	5,740.8
1983	5,130.8
1984	4,690.7

Source: Association of American Railroads.

Railroads have met only a small proportion of their capital needs through the sale of stock. The high cost of stock issuance and the special debenture nature of debt instruments have made ETCs and CSAs considerably more attractive than stocks. Further, prospective investors looking for fast growth in a firm would not be enticed by the railroad industry which is a mature industry whose survival depends more on its ability to internally generate funds than to attract outside funds. Given the financial condition of the railroads in recent years and the relatively higher risk involved in stocks, investors have been less inclined to invest in rail stocks. This was confirmed by the financial analysts with whom we spoke.

As shown in table 3.6, another source of funds for the railroads has been property sales. Since 1980, property sales have been an important component of railroad financing activities. Figure 3.11 indicates that since 1981, railroads have raised more capital from the sale of property than from the sale of stocks.

It was not possible to determine the composition of property sales. According to a finance official at the Association of American Railroads, they do not compile such data. We also found that ICC only keeps aggregate data. Property sales have included the sale of real estate as well as assets derived from the land. The latter has been especially important for the western Class I railroads that have been able to profit from the assets of their land grants, such as timber, minerals, gas, and coal.

Table 3.6

Funds from Property Sales

Year	Amount (thousands)
1980	$417,996
1981	553,193
1982	477,013
1983	900,934
1984	456,551

Source: ICC.

A final source of funds comes from the flow of funds between the holding company and the railroad. However, it is very difficult to trace this flow of funds. Analysts told us that they find it difficult to discern monies from different sources as holding companies are not required to report on their balance sheets the flow of such funds between railroad and holding company/affiliate. In particular, an Association of American Railroads official stated that holding company rail and nonrail assets are lumped together on the holding company's balance sheet and income statement, thus making it almost impossible for an analyst to determine which funds came from where.

RAILROAD ASSET BASES ARE SHRINKING

Table 3.7

Trends in Asset Base Components

Year	Miles of rail line owned	Locomotives in service	Freight cars in service
1975	191,520	28,210	1,359,459
1976	185,395	27,612	1,331,705
1977	182,380	27,667	1,287,315
1978	175,912	27,400	1,226,500
1979	169,927	28,097	1,217,079
1980	164,822	28,396	1,168,114
1981	162,160	27,808	1,111,115
1982	159,123	27,073	1,039,016
1983	155,879	25,838	1,007,165
1984	151,998	24,506	948,171

Source: Association of American Railroads.

RAILROAD ASSET BASES ARE SHRINKING

In order to rationalize their systems and to get rid of excess capacity, railroads are continuing to reduce the physical size of their asset bases. Between 1980 and 1984, the miles of railroad line owned, the number of locomotives in service, and the number of freight cars in service all decreased. The decline in the physical size of the asset base has resulted from continued abandonments and from a decline in the number of locomotives and freight cars installed.

Table 3.8

Abandonments and Installation of Locomotives and Freight Cars

Year	Miles of abandonments[a]	Locomotives installed	Freight cars installed
1980	2,321	1,666	86,628
1981	2,914	686	45,925
1982	3,100	501	18,736
1983	2,162	343	5,872
1984	2,032	680	12,396

[a] Abandonment data do not include Conrail abandonments.

Source: ICC and Association of American Railroads.

Despite the current streamlining efforts the railroads have already made, railroad officials, financial analysts, and academics believe that the railroads will need to shed more excess capacity in order to improve long-run profitability.

RAILROAD PERFORMANCE IN 1984 COMPARED WITH THAT OF OTHER INDUSTRIES

Table 3.9

Interindustry Comparison Using Selected Financial Indicators, 1984

	Financial indicators				
Industry	Return on equity	Return on total capitalization	Operating ratio	Current ratio	Capital structure ratio
	(percent)	(percent)	(percent)		(percent)
Railroad	9.8	9.9	87.7	1.2	27.1
Trucking	11.2	11.5	96.1	1.2	30.6[a]
Electric utility	13.5[a]	11.1[a]	73.5[a]	1.2[a]	48.2[a]
Natural gas pipeline	14.6[a]	13.9[a]	90.6[a]	1.2[a]	39.4[a]
Steel	-2.3	4.1[a]	101.1[a]	1.4[a]	44.4[a]
Industrial chemicals & synthetics	11.5	9.3	N/A	1.5[a]	27.9[a]
Oil and gas	11.1	9.7	88.3[a]	1.1[a]	33.2[a]

[a] Calculated by GAO using reported data.

N/A = not available.

RAILROAD PERFORMANCE IN 1984 COMPARED WITH THAT OF OTHER INDUSTRIES

The 1984 financial performance of the railroads, as measured by the financial indicators we selected, was similar to that of six comparable industries. We obtained data for return on equity, return on total capitalization, operating ratio, current ratio, and capital structure ratio. We then compared the railroads' performance as measured by these ratios with the performance of the trucking, electric utility, natural gas pipeline, industrial chemicals and synthetics, oil and gas, and steel industries. The railroads appear to have performed as well as or better than most of these industries in all but return on equity.

Because of several limitations to our data, caution is needed in interpreting these results. First, because of limited availability, we used data for only 1 year. Second, the data came from 10 sources, and we were unable to ascertain the level of consistency in the samples used to produce the data. Third, most sources gave only a limited amount of information regarding the calculations used to produce their figures. Fourth, all of the sources used data from samples drawn from companies in the industry rather than data from the entire industry. Fifth, although each industry shares some characteristics with the railroads, none is strictly comparable. Finally, the reporting entity was often a corporation conducting business in more than one industry, so the financial performance of the subject industry may have been mixed with the performance of operations in other industries. (These data limitations are discussed in detail in app. II.)

BLANK PAGE

SECTION 4

ALTERNATIVE APPROACHES FOR MEASURING RAILROAD REVENUE ADEQUACY

FOUR ALTERNATIVE APPROACHES ARE AVAILABLE FOR MEASURING RAILROAD REVENUE ADEQUACY

--ICC'S EXISTING APPROACH.

--TRADITIONAL APPROACH.

--CURRENT COST APPROACH.

--MULTIPLE INDICATOR APPROACH.

FOUR ALTERNATIVE APPROACHES ARE AVAILABLE FOR MEASURING RAILROAD REVENUE ADEQUACY

There are four primary alternative methods available for measuring railroad revenue adequacy.

--ICC's existing approach that compares the current cost of capital with an ROI calculated using RRB accounting.

--A "traditional" approach that compares the cost of capital with an ROI calculated using depreciation accounting.

--A current cost approach that would compare the real, inflation adjusted, current cost of capital with an ROI calculated using an estimate of the current reproduction cost of the net investment base.

--The use of multiple indicators to measure financial health similar to the approach employed by stock and bond analysts and by ICC in revenue adequacy determinations made under the 4R Act.

The remainder of this section describes these alternatives, evaluates the results of their application using 1984 data for the nation's major Class I railroads, and highlights the major issues associated with their use.

ICC'S EXISTING APPROACH FOR MEASURING REVENUE ADEQUACY

--ICC DETERMINES REVENUE ADEQUACY ANNUALLY BY COMPARING EACH CLASS I RAILROAD'S ROI WITH THE CURRENT COST OF CAPITAL.

--RAILROADS WITH AN ROI GREATER THAN OR EQUAL TO THE COST OF CAPITAL ARE CONSIDERED REVENUE ADEQUATE.

--ICC CALCULATES ROI AS FOLLOWS:

$$\text{ROI} = \frac{\text{NET RAILWAY OPERATING INCOME}}{\text{NET INVESTMENT BASE}}$$

--ICC DETERMINES THE COST OF CAPITAL AS FOLLOWS:

COST OF DEBT x PERCENTAGE DEBT IN CAPITAL STRUCTURE = WEIGHTED COST OF DEBT
+
COST OF EQUITY x PERCENTAGE EQUITY IN CAPITAL STRUCTURE = WEIGHTED COST OF EQUITY
COST OF CAPITAL

--USING THIS METHODOLOGY, ICC DETERMINED THE 1984 CURRENT COST OF CAPITAL AS FOLLOWS:

COMPONENT	COST		PERCENTAGE OF CAPITAL STRUCTURE		WEIGHTED COST
DEBT	12.8%	X	33.9%	=	4.34%
EQUITY	17.3%	X	66.1%	=	11.44%
					15.78% =
					1984 CURRENT COST OF CAPITAL

ICC'S EXISTING APPROACH FOR MEASURING REVENUE ADEQUACY

ICC determines revenue adequacy annually by comparing each Class I railroad's ROI to an estimate of the current cost of capital. ROI is calculated for the original cost of the net investment base as reported under RRB accounting. Railroads with rates of return greater than or equal to the current cost of capital are considered revenue adequate. ICC's existing approach is unique in two respects--the use of RRB accounting and the method used to estimate the current cost of capital.

Although it began requiring the use of depreciation accounting in 1983 for financial reporting purposes, ICC continues to use RRB accounting for revenue adequacy and other regulatory purposes. In order to calculate ROI on an RRB basis, ICC requires the railroads to supply, in addition to their regular financial statements, a special supplemental report containing net railway operating income and net investment base data developed using RRB accounting. ICC has maintained this separate approach because it believes that depreciation accounting may not adequately compensate the railroads for the effects of inflation. ICC has proposed using an estimate of the current cost investment base in combination with depreciation accounting as a method to compensate for its concern about the impact of inflation.

ICC determines the cost of capital using the current cost of debt and the current cost of equity weighted by a debt/equity ratio based on market values. ICC adopted this approach as part of its 1981 decision implementing a single standard for revenue adequacy. In ICC's view, the railroads need to earn a return equal to a current or opportunity cost of capital in order to compete for scarce business funds and to assure that railroad management finds reinvestment in the railroads attractive.

ICC determines the current cost of capital on an industrywide basis, rather than for each individual railroad. The current debt and equity cost for six major railroad systems are weighted together to form a composite estimate of the current cost of capital. This approach is used because not all Class I railroads meet ICC's selection criteria regarding their size and the value of their stocks and bonds.

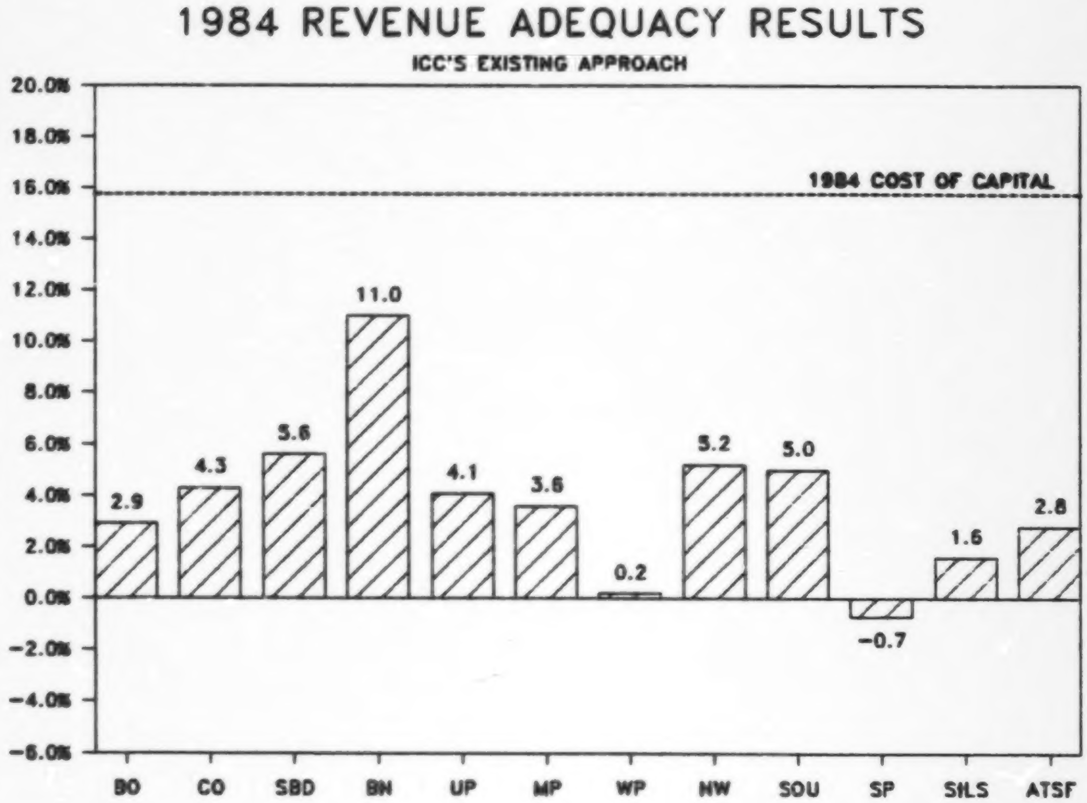
ICC estimates the current cost of debt by developing a weighted average of the estimated current yield on railroad debt instruments--mortgage bonds, ETCs, and CSAs. Estimates are required because many of these instruments, in particular, ETCs and CSAs are not traded on secondary markets and, as a result, their values are not directly observable.

The current cost of equity is estimated using a version of the discounted cash flow model--a method widely employed by regulatory agencies. Under the discounted cash flow methodology, the current cost of equity is the discount rate that makes the present value of all expected returns from holding a railroad's stock--dividends and appreciation in the stock's price--equal to the current market value of the stock. To arrive at the 1984 current cost of equity, ICC combined estimates of the 1984 dividend yield with estimates of the expected growth rate in railroad earnings over the next 5 years.

The estimated cost of debt and equity are weighted by estimates of the current market value of the debt and equity issuances of the six composite railroad systems to arrive at an overall current cost of capital.

BLANK PAGE

Figure 4.1



SOURCE: ICC

REVENUE ADEQUACY RESULTS-- ICC'S EXISTING METHOD

None of the Class I railroads we evaluated was considered revenue adequate in 1984 under ICC's existing approach. The Burlington Northern Railroad is the closest to revenue adequacy, with a 4.8 percentage point shortfall. The Southern Pacific Railroad is the most distant, with a 16.5 percentage point shortfall.

Table 4.1

Revenue Adequacy Shortfall Under ICC's Existing Approach

Major Class I railroads	Percentage points revenue inadequate
Baltimore & Ohio	-12.9
Chesapeake & Ohio	-11.5
Seaboard	-10.2
Burlington Northern	- 4.8
Union Pacific	-11.7
Missouri Pacific	-12.2
Western Pacific	-15.6
Norfolk & Western	-10.6
Southern	-10.8
Southern Pacific	-16.5
St. Louis & Southwestern	-14.2
Atchison, Topeka & Santa Fe	-13.0

ISSUES SURROUNDING ICC'S EXISTING APPROACH

--ICC'S ROI COMPUTATION HAS BEEN CRITICIZED FOR

- BEING BASED ON RRB INSTEAD OF DEPRECIATION ACCOUNTING,
- NOT INCLUDING ALL ELEMENTS OF TRANSPORTATION-RELATED INCOME, INVESTMENT, AND EXPENSE, AND
- BEING CALCULATED FOR ONLY INDIVIDUAL CLASS I RAILROADS.

--ICC'S COST OF CAPITAL DETERMINATION HAS BEEN CRITICIZED FOR

- THE USE OF THE CURRENT COST OF DEBT,
- THE FAILURE TO RECOGNIZE DEFERRED TAXES AS A SOURCE OF CAPITAL, AND
- THE USE OF A MARKET-BASED DEBT/EQUITY RATIO.

ISSUES SURROUNDING ICC'S EXISTING APPROACH

In general, ICC's revenue adequacy determinations have been criticized by rail shippers and their trade associations as being contrary to the views of financial analysts that several of the nation's largest railroads are in adequate financial condition. ICC's Chairman acknowledged this criticism in February 1986 testimony before the Subcommittee on Surface Transportation, Senate Committee on Commerce, Science, and Transportation. More specifically, shippers and their trade associations have criticized particular aspects of ICC's method for calculating ROI and for determining the cost of capital as being contrary to generally accepted regulatory practices.

ICC's use of RRB accounting data for calculating ROI has been criticized as being contrary to the generally accepted regulatory practice of using depreciation accounting. In a February 1981 report, Accounting Changes Needed in the Railroad Industry (AFMD-81-26), we supported the change to depreciation accounting, noting that it would better measure the railroads' operating costs and would enhance the comparability of the railroads' financial reporting.

ICC's ROI computation has also been criticized for (1) being understated by not including all elements of transportation-related income, investment, and expense and (2) being calculated for only Class I railroads and not on a consolidated, systemwide basis. In its March 1983 proceeding, Ex Parte 393 (Sub-No. 1), Proposed Revision to Existing Standards for Determination of Revenue Adequacy of Railroads, ICC proposed to address both of these concerns.

ICC's method for determining the cost of capital has also received considerable criticism. Specifically, shippers, their trade associations, and the National Association of Regulatory Utility Commissioners have expressed concerns about (1) ICC's use of the current cost of debt, (2) the failure of ICC's method to recognize deferred taxes as a source of capital, and (3) the use of a market-based debt/equity ratio.

ICC's use of the current cost of debt has been criticized as being contrary to accepted regulatory practice. Most state utility commissions use the embedded, or contractual, cost of debt to determine the cost of capital. Concern has been expressed that when current rates are above embedded rates, as they have been in recent years, the cost of debt is overstated since the railroad is only required to pay existing bondholders the interest rate under which the debt was issued.

A more virulent criticism of ICC's existing method has been its failure to account for deferred taxes. Deferred taxes arise because accelerated depreciation is used for tax purposes while straight-line depreciation is used for regulatory rate-setting purposes. Using accelerated depreciation, a railroad will pay a lower tax during the early years of an asset's life than if straight-line depreciation were used. These deferred taxes, however, must be paid in future years when the depreciation expense reported for tax purposes (based on accelerated depreciation) falls below the expense attributable to straight-line depreciation. During the time these taxes are deferred, however, the railroad can invest these funds. Thus, deferred taxes represent a "zero-interest" loan from the government. State and federal regulatory commissions, unlike ICC, recognize deferred taxes as a source of capital and adjust for them in determining the cost of capital.

A final criticism of ICC's existing cost of capital methodology is its use of market values for weighting the cost of debt and equity. While ICC views the use of market values as consistent with its use of current, or market, debt and equity costs, shippers believe that market values should not be used because they do not represent the actual recorded, or book, value of the railroads' capital structure.

BLANK PAGE

TRADITIONAL APPROACH FOR MEASURING REVENUE ADEQUACY

--THE TRADITIONAL APPROACH IS BASED ON THE METHODS USED BY STATE AND FEDERAL REGULATORY UTILITY COMMISSIONS.

--ALTHOUGH IT DETERMINES REVENUE ADEQUACY IN THE SAME MANNER AS ICC'S EXISTING APPROACH--BY COMPARING ROI WITH THE COST OF CAPITAL--IT DIFFERS FROM ICC'S EXISTING APPROACH IN SEVERAL KEY RESPECTS.

- ROI IS CALCULATED USING DEPRECIATION ACCOUNTING.
- COST OF CAPITAL IS DETERMINED USING THE EMBEDDED COST OF DEBT INSTEAD OF THE CURRENT COST OF DEBT.
- DEFERRED TAXES ARE RECOGNIZED AS A "ZERO-INTEREST" SOURCE OF CAPITAL.
- BOOK VALUES ARE USED TO WEIGHT THE COST OF DEBT AND EQUITY

--UNDER A TRADITIONAL APPROACH THE 1984 COST OF CAPITAL WOULD BE CALCULATED AS FOLLOWS:

COMPONENT	COST		WEIGHT		WEIGHTED COST
DEBT	9.95%	X	18.68%	=	1.86%
EQUITY	17.30%	X	57.66%	=	9.98%
DEFERRED TAXES	0.00%	X	23.66%	=	0.00%
			100.00%		11.84% =
					1984 COST OF CAPITAL

TRADITIONAL APPROACH FOR MEASURING REVENUE ADEQUACY

The traditional approach for measuring revenue adequacy is based on the methods employed by state and federal regulatory utility commissions to determine ROI and the cost of capital as part of periodic rate-setting proceedings. Prior to the adoption of its existing standard in 1981, ICC used a method similar to the traditional approach to determine the cost of capital. Legislation has been proposed that would require ICC to again use a traditional approach for measuring revenue adequacy.

Although revenue adequacy under a traditional approach would be determined in the same manner as ICC's existing approach--by comparing ROI with the cost of capital--the traditional approach differs from ICC's existing approach in terms of how ROI is calculated and how the cost of capital is determined.

Under a traditional approach, ROI is calculated for the original cost of the net investment base as reported under depreciation accounting for all of the railroad's assets. Under ICC's existing approach, RRB accounting is used for track structures. The use of depreciation accounting for track structures tends to decrease railroad's expenses and, therefore, to increase the reported ROI for most railroads; however, the difference is usually in the range of only 1 to 2 percentage points. The differences between RRB accounting and depreciation accounting are discussed in appendix I.

The traditional approach for determining the cost of capital differs from ICC's existing approach in several key respects: (1) it uses the embedded cost of debt instead of the current cost of debt, (2) it recognizes deferred taxes as a source of capital, and (3) it uses book values to weight the cost of capital components.

A traditional approach for determining the cost of capital uses the embedded, or contractual, cost of debt. The embedded cost of debt is used because, under a traditional approach, debt is viewed as an actual cost that needs to be recovered through the rate of return. Proponents of a traditional approach, therefore, argue that a railroad only needs to recover its actual debt costs, which consist of the contractual rate for debt incurred during the current and prior years. Appendix III describes our method for estimating the 1984 cost of embedded debt.

Under a traditional approach, deferred taxes are recognized as a zero-interest loan from the government. Deferred taxes are created because regulators allow rates to be set on the basis of straight-line depreciation, while taxes are paid on the basis of accelerated depreciation. Since neither railroad equity holders nor bondholders provide these funds, under the traditional approach, the railroads would not require a return on them.

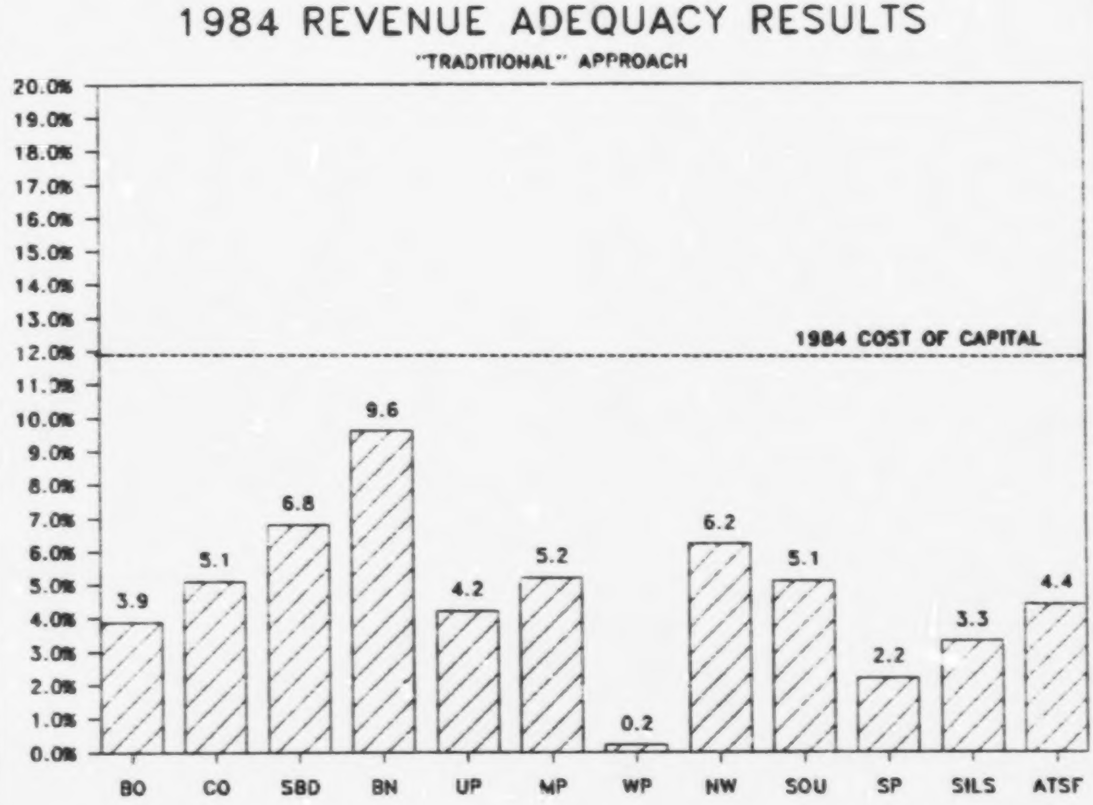
To reflect this view, one of two possible adjustments for deferred taxes are made. One adjustment excludes the amount of a firm's deferred tax liability from its investment base when determining ROI. The other adjustment leaves the investment base intact but considers the deferred tax liability as a zero-interest source of capital.

We employed the second adjustment. We used the deferred tax liability of the six railroad systems contained in ICC's existing approach to develop our weighting system and considered deferred taxes as a zero-interest source of capital. We selected the second approach because (1) it would allow us to use reported ROI data and (2) each railroad would be affected uniformly regardless of the amount of its deferred tax liability since the adjustment was being made in the cost of capital and not in the ROI.

Finally, because the traditional approach uses actual data for the cost of debt and deferred taxes, a weighting scheme is used that is based on recorded "book" values for the cost of debt, the cost of equity, and deferred taxes. In order to provide a basis for comparison with ICC's existing approach, we used book data for the same six railroad systems contained in ICC's existing approach.

BLANK PAGE

Figure 4.2



1984 REVENUE ADEQUACY RESULTS

"TRADITIONAL" APPROACH

SOURCE: ICC

REVENUE ADEQUACY RESULTS--TRADITIONAL APPROACH

Although a traditional approach does result in a lower cost of capital than ICC's existing approach, none of the Class I railroads we evaluated would have been considered revenue adequate in 1984 under the traditional approach. The Burlington Northern Railroad was once again the closest to revenue adequacy, with a 2.2 percentage point shortfall. The Western Pacific Railroad was the most distant, with an 11.6 percentage point shortfall. Because different accounting systems are used to compute ROI, strict comparisons cannot be made between ICC's existing method and the traditional method; however, overall, the selected railroads would be closer to revenue adequacy if a traditional approach were used.

Table 4.2

Revenue Adequacy Shortfall Comparison

	Percentage points revenue inadequate	
Major Class I railroads	ICC's existing approach	Traditional approach
Baltimore & Ohio	-12.9	-7.9
Chesapeake & Ohio	-11.5	-6.7
Seaboard	-10.2	-5.0
Burlington Northern	-4.8	-2.2
Union Pacific	-11.7	-7.6
Missouri Pacific	-12.2	-6.6
Western Pacific	-15.6	-11.6
Norfolk & Western	-10.6	-5.6
Southern	-10.8	-6.7
Southern Pacific	-16.5	-9.6
St. Louis & Southwestern	-14.2	-8.5
Atchison, Topeka & Santa Fe	-13.0	-7.4

In employing a traditional approach, we used reported ROI data. In its study of revenue adequacy, the Edison Electric Institute--the trade association of the investor-owned electric utilities--adjusted the railroads' ROI data to account for some elements of transportation-related income, investment, and expense. This adjustment was made because they believe that these elements should be considered in determining revenue adequacy. We did not make these adjustments because (1) there are numerous alternative proposals for addressing this issue and (2) in many instances, data to make all the proposed adjustments were not available.

ISSUES SURROUNDING THE TRADITIONAL APPROACH

--ICC AND THE RAILROADS HAVE OPPOSED THE TRADITIONAL APPROACH'S TREATMENT OF THE COST OF DEBT AND DEFERRED TAXES ON CONCEPTUAL GROUNDS.

--ICC AND THE RAILROADS BELIEVE THAT REVENUE ADEQUACY SHOULD CAPTURE THE OPPORTUNITY COSTS TO INVESTORS OF LOANING FUNDS.

--USE OF THE EMBEDDED COST OF DEBT IN ICC'S EXISTING APPROACH WOULD REDUCE THE ESTIMATED 1984 COST OF CAPITAL BY ABOUT 1 PERCENTAGE POINT.

--ICC AND THE RAILROADS OBJECT TO THE INCLUSION OF DEFERRED TAXES IN THE COST OF CAPITAL ON THE GROUNDS THAT IT WOULD REDUCE THE RAILROADS' INCENTIVE TO REINVEST THESE FUNDS.

--INCLUSION OF DEFERRED TAXES IN ICC'S EXISTING APPROACH WOULD REDUCE THE ESTIMATED 1984 COST OF CAPITAL BY ALMOST 4 PERCENTAGE POINTS.

ISSUES SURROUNDING THE TRADITIONAL APPROACH

The use of a traditional approach, in particular its use of the embedded cost of debt and its treatment of deferred taxes, has been opposed by ICC and the railroads, primarily on conceptual grounds.

ICC and the railroads have opposed the use of the embedded cost of debt because they believe revenue adequacy should be a forward-looking concept. Rather than determine the cost of capital by looking at what return the railroads need to earn to satisfy existing debt holders, ICC and the railroads believe that revenue adequacy should capture the opportunity cost to investors of loaning funds to the railroads in today's market. ICC and the railroads point to the fact that the railroads compete for scarce investment funds and, therefore, need to offer returns that are competitive with current alternative investment opportunities, as support for the use of current debt costs instead of embedded debt costs.

The practical effect of using embedded debt costs instead of current debt costs is limited. For example, as shown in table 4.3, if our estimate of the 1984 cost of embedded debt is substituted into ICC's existing method and market debt/equity weights are used, the cost of capital would decline from 15.78 percent to 14.81 percent. If book debt/equity weights are used, the cost of capital would be 15.49 percent.

Table 4.3

Comparison of Using the Cost of Embedded Debt in Alternative Cost of Capital Determinations

A. Use of the cost of embedded debt with market weights

Component	Cost		Weight		Weighted cost
Debt	9.95%	X	33.9%	=	3.37%
Equity	17.30%	X	66.1%	=	11.44%
			100.0%		14.81%

B. Use of the cost of embedded debt with book weights

Component	Cost		Weight		Weighted cost
Debt	9.95%	X	24.5%	=	2.43%
Equity	17.30%	X	75.5%	=	13.06%
			100.0%		15.49%

ICC and the railroads have opposed the inclusion of deferred taxes in determining revenue adequacy on the grounds that it would discourage the railroads from investing the funds they gain from deferred taxes in their railroad operations. They believe that including deferred taxes denies the railroads a return on these funds and that without such a return the railroads would have an incentive to invest these funds in other businesses. Proponents of the traditional approach argue that investors have not provided the funds represented by deferred taxes and that to include them in the measurement of revenue adequacy is unnecessary.

The practical impact of including deferred taxes is greater than the impact of using the embedded cost of debt. If the deferred tax liability of the six composite railroad systems is included at zero-interest in ICC's existing methodology, the cost of capital declines from 15.78 percent to 11.97 percent.

Table 4.4

Impact of Including Deferred Taxes in ICC's Existing Revenue Adequacy Approach

Component	Cost		Weight		Weighted cost
Debt	12.8%	X	25.8%	=	3.30%
Equity	17.3%	X	50.1%	=	8.67%
Deferred taxes	0.0%	X	24.1%	=	0.00%
			100.0%		11.97%

BLANK PAGE

ISSUES SURROUNDING THE USE OF DEPRECIATION ACCOUNTING

--TWO ISSUES ARE ASSOCIATED WITH ICC'S USE OF DEPRECIATION ACCOUNTING--PREDECESSOR COSTS AND THE ASSET BASE WRITE-UP.

--WHEN A RAILROAD HAS HAD ITS ASSETS WRITTEN-DOWN AS A RESULT OF A SALE OR A REORGANIZATION, ICC USES THE ORIGINAL, OR PREDECESSOR COSTS, OF THE ASSETS TO COMPUTE ROI.

--THE USE OF PREDECESSOR COSTS CAN AFFECT REPORTED ROI BY AS MANY AS 6 PERCENTAGE POINTS.

--WHEN ICC CONVERTED FROM RRB ACCOUNTING TO DEPRECIATION ACCOUNTING FOR FINANCIAL REPORTING PURPOSES, IT ALLOWED THE RAILROADS TO WRITE-UP THE VALUE OF THEIR ASSET BASES FOR SEVERAL PRIOR YEARS AS IF DEPRECIATION ACCOUNTING HAD BEEN IN USE.

--RAIL SHIPPER ORGANIZATIONS BELIEVE THAT THIS PROCEDURE ALLOWS THE RAILROADS TO RECOVER THE COST OF SOME TRACK REPLACEMENTS A SECOND TIME.

ISSUES SURROUNDING THE USE OF DEPRECIATION ACCOUNTING

If a traditional approach for measuring revenue adequacy were adopted, two issues would need to be resolved regarding ICC's use of depreciation accounting. These issues involve the use of predecessor costs and the write-up of the railroads' asset base permitted when the railroads converted from RRB to depreciation accounting.

In its 1983 and 1984 revenue adequacy determinations, ICC reported ROI on a depreciation accounting as well as an RRB accounting basis. In using depreciation accounting, however, ICC adjusted the reported ROI for seven Class I railroads (see table 4.5). All of these railroads had had their asset bases materially written-down as the result of either their purchase or reorganization. Rather than use the written-down values in computing ROI, ICC used what it called predecessor costs in computing ROI. Predecessor costs are the original costs of the assets prior to the write-down. The use of predecessor costs can affect reported ROI by as many as 6 percentage points.

Table 4.5

Comparison of 1984 ROI Using Predecessor and Written-Down Asset Costs

Railroad	Return on net investment: Written-down costs (percent)	Return on net investment: Predecessor costs (percent)
Boston & Maine	9.3	3.1
Conrail	8.7	6.9
Delaware & Hudson	-7.4	-4.7
Pittsburgh & Lake Erie	-3.0	-1.9
Seaboard	6.8	5.7
Chicago & Northwestern	5.5	4.3
Western Pacific	0.2	-0.9

Source: ICC.

Given ICC's preference for market data in its existing approach for measuring revenue adequacy, we asked officials in the Cost Analysis Section of ICC's Bureau of Accounts, who are responsible for ICC's revenue adequacy determinations, why they used predecessor costs. Their reply was that they used predecessor costs because they did not believe the amount actually paid for the railroads in question accurately reflected the values of the assets. If ICC did not use predecessor costs, the new owners would not earn enough of a return to replace the assets they had purchased when the assets wore out, according to the officials.

Because market transactions should reflect the earning power the new owners anticipate from the assets they are purchasing, we used ROI reported on the basis of the written-down asset values in assessing the impact of the traditional approach for measuring revenue adequacy.

The other issue associated with the use of depreciation accounting is the write-up of the railroads' asset bases permitted when the railroads converted from RRB accounting to depreciation accounting for financial reporting purposes.

When ICC required the conversion to depreciation accounting, the railroads requested a determination by the Financial Accounting Standards Board on how to report the change on their public financial statements. The Board approved the switch to depreciation accounting and permitted the railroads to restate their financial statements as if depreciation accounting had been in use for each period presented. To implement the adjustment, the railroads went back to the last replacement of track structure assets and determined the amounts that would have been capitalized and depreciated to date, assuming depreciation accounting had been in use.

According to data developed by the Railroad Accounting Principles Board, the average net investment base for all Class I railroads in 1983 increased by about 22 percent. While some of this increase was attributable to the capitalization of 1983 track expenditures, according to the Board's staff, the majority of the increase was the result of the conversion from RRB accounting to depreciation accounting.

Rail shippers have objected to this write-up. They point out that under RRB accounting the railroads charged the replacement of the track structure as an expense in the year in which the replacement occurred. By allowing the railroads to now charge a depreciation expense on that track structure, ICC, in the shippers' view, is allowing the railroads to recover these expenses twice. If a traditional approach were to be used to determine revenue adequacy, some shipper organizations have proposed that the railroads' ROI be adjusted to eliminate this perceived double counting.

On the other hand, when it ordered the conversion to depreciation accounting, ICC did not agree with this argument. The Commission viewed the expense charged for the replacement as a recoupment of the economic costs incurred between the time track was first installed and the time it was replaced. According to ICC, the depreciation expense that the railroads were now being allowed was intended to compensate the railroads for the ongoing deterioration of track that had been replaced.

BLANK PAGE

CURRENT COST APPROACH FOR MEASURING REVENUE ADEQUACY

--IN MARCH 1983, ICC PROPOSED ADOPTING A CURRENT COST APPROACH FOR CALCULATING ROI AND, THUS, DETERMINING REVENUE ADEQUACY.

--ICC'S METHODOLOGY FOR ESTIMATING CURRENT COSTS IS KNOWN AS TRENDED NET ORIGINAL COST (TNOC).

--TNOC ESTIMATES THE DEPRECIATED CURRENT REPRODUCTION COST OF A RAILROAD'S TRANSPORTATION ASSETS BY APPLYING A SERIES OF INDEXES TO THE ASSETS' ORIGINAL COSTS.

--UNDER ICC'S PROPOSED APPROACH, NET RAILWAY OPERATING INCOME IS ALSO RECALCULATED TO REFLECT THE CURRENT--HIGHER--DEPRECIATION EXPENSE.

CURRENT COST APPROACH FOR MEASURING REVENUE ADEQUACY

In March 1983, ICC proposed a series of revisions to its existing standard for determining revenue adequacy. Use of a current cost methodology for determining revenue adequacy was a major part of the proposed revisions.

The purpose of current cost accounting is to lessen the distorting effects of price inflation on financial data. A railroad's asset base is made up of a wide variety of assets bought over many decades. In order to maintain the viability of its operations, a railroad needs to earn revenues sufficient to replace the assets necessary to its operations when they wear out. When original cost accounting is used during a period of price inflation, ROI may not accurately reflect the railroad's ability to earn the replacement cost of assets. Specifically, the depreciation charges based on an asset with an original cost of $100 will not, in themselves, be sufficient to replace the asset if the inflated new cost is $300. To counter this distorting effect of inflation, ICC proposed to use a method of accounting that would assign current costs to railroad assets.

ICC has proposed a current cost accounting system known as Trended Net Original Cost (TNOC). TNOC uses a series of cost-change (or inflation) indexes to estimate, from original cost data, the reproduction cost of the various classes of assets owned by the railroads. For example, under TNOC, original cost data associated with Uniform System of Accounts Property Account Number 6, bridges and trestles, would be inflated using a building cost index prepared by Engineering News Record Magazine. Depreciation charges are also adjusted for inflation.

An example of how TNOC affects ROI calculations can be seen in the net rail operating income and net transportation investment base of the Burlington Northern Railroad. Under original cost depreciation accounting, Burlington Northern's net railway operating income in 1984 was about $547 million. TNOC, however, produces a net railway operating income of only about $238 million, because the depreciation charges against income increase considerably under TNOC. In contrast, the net transportation investment base rises from about $5.7 billion under original cost depreciation accounting to more than $17.9 billion under TNOC. This shift reflects the effects of inflation on the reproduction cost of assets used in the Burlington Northern's railroad operations. Burlington Northern's ROI for 1984, using depreciation accounting, was 9.6 percent, while its TNOC ROI would be only 1.3 percent.

CURRENT COST APPROACH USES THE REAL COST OF CAPITAL

--BECAUSE THE EFFECTS OF INFLATION ARE ADJUSTED FOR IN THE INDEXING PROCESS, RATES OF RETURN ON A CURRENT COST BASIS SHOULD BE COMPARED WITH THE "REAL"--INFLATION ADJUSTED--CURRENT COST OF CAPITAL.

--ICC HAS USED THE GROSS NATIONAL PRODUCT PRICE DEFLATOR TO ADJUST THE CURRENT COST OF CAPITAL FOR INFLATION.

--THE 1984 REAL CURRENT COST OF CAPITAL IS ESTIMATED AS FOLLOWS:

CHANGE IN GROSS NATIONAL PRODUCT DEFLATOR
FOR 1984 = 3.76%

COMPONENT	DEFLATED COST		WEIGHT		WEIGHTED COST	
DEBT	8.71%	X	33.9%	=	2.95%	
EQUITY	13.05%	X	66.1%	=	8.63%	
			100.0%		11.58%	= 1984 REAL CURRENT COST OF CAPITAL

CURRENT COST APPROACH USES THE REAL COST OF CAPITAL

The 4R Act directed ICC to establish revenue levels that would, among other things, permit the railroads to cover the effects of inflation. TNOC adjusts for the effects of inflation in its revaluation of the asset base. Consequently, to avoid over-compensating the railroads, an "inflation premium" must be taken out of the cost of capital that will be compared with the TNOC-based ROI.

There are basically two ways a railroad can fully recover its costs--(1) it can earn a return on the original cost of its assets equal to the nominal cost of its capital or (2) it can earn a return on the inflation-adjusted cost of its assets equal to the real cost of capital. Compensation for the effects of inflation occurs early in the life of the investment under the first method while cost recovery occurs more evenly throughout the life of the investment in the second case.

Investors and lenders anticipate that price inflation will decrease the value of the money they later receive for their initial investments. They factor this into the rate of return (or interest rate) they demand before making investments or lending money. The amount by which this "nominal" rate of return is higher than the "real" rate of return--the return that would be expected if there were no inflation--is called an "inflation premium."

ICC's TNOC proposal is based on the assumption that railroads should earn compensation for the effects of inflation throughout the useful lives of their investments. Consequently, under TNOC railroads' returns should be compared with a cost of capital not containing an inflation premium. To compare ROI calculated under TNOC with the nominal cost of capital would allow a railroad to recover the costs of inflation twice--once in the calculation of ROI and again in the cost of capital.

ICC's TNOC proposal adjusts the nominal cost of capital to produce a real cost of capital by using the Gross National Product Price Deflator. The formula ICC uses to determine the real cost of capital is as follows:

$$r = [\ [\ (1+n)/(1+i)] - 1\ ] \times \text{percent debt}$$

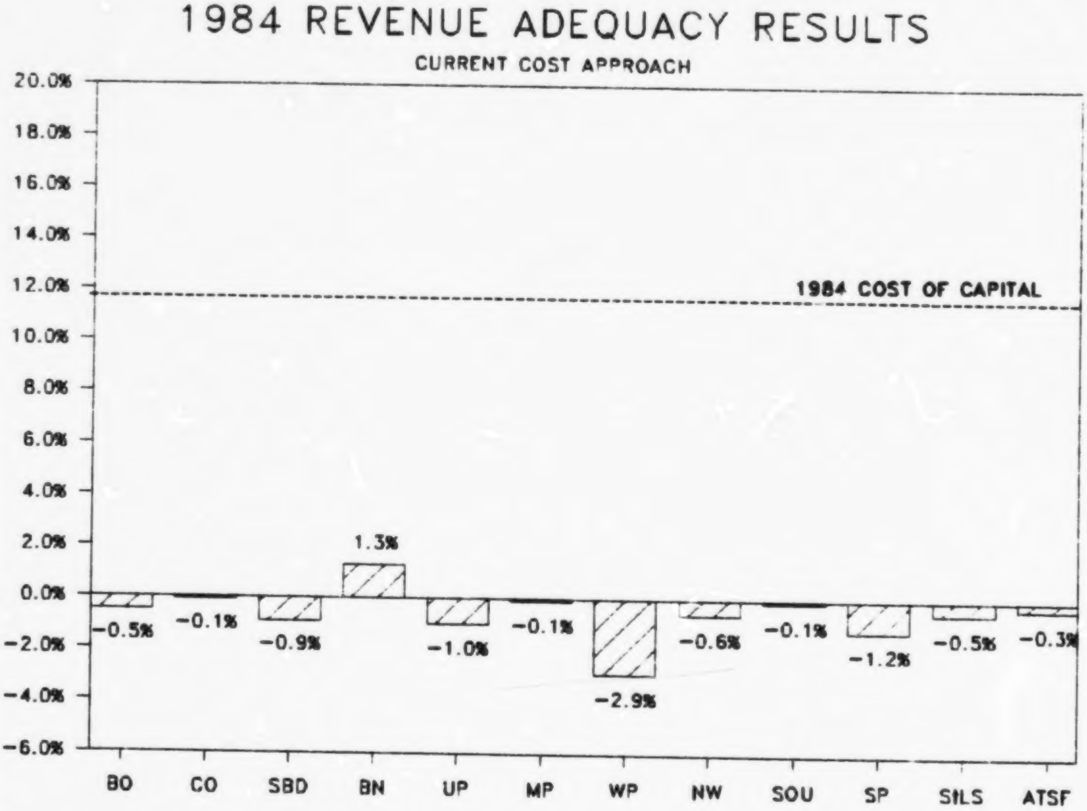
$$+ [[\ (1+n)/(1+i)] - 1\ ] \times \text{percent equity}$$

Where r = real cost of (debt and equity) capital

n = nominal cost of debt or equity capital

i = inflation rate (Gross National Product Price Deflator)

Figure 4.3



SOURCE: ICC

REVENUE ADEQUACY RESULTS-- CURRENT COST APPROACH

None of the Class I railroads we evaluated would have been considered revenue adequate in 1984 under a current cost approach. Parallel to the results under ICC's existing method and the traditional approach, the Burlington Northern Railroad would be the closest to revenue adequacy, with a 10.3 percentage point shortfall. The Western Pacific Railroad would be the farthest from revenue adequacy, with a 14.5 percentage point shortfall.

Table 4.6

Revenue Adequacy Shortfall Comparison

	Percentage points revenue inadequate		
Major Class I railroads	ICC's existing method	Traditional approach	Current cost approach
Baltimore & Ohio	-12.9	-7.9	-12.1
Chesapeake & Ohio	-11.5	-6.7	-11.7
Seaboard	-10.2	-5.0	-12.5
Burlington Northern	-4.8	-2.2	-10.3
Union Pacific	-11.7	-7.6	-12.6
Missouri Pacific	-12.2	-6.6	-11.7
Western Pacific	-15.6	-11.6	-14.5
Norfolk & Western	-10.6	-5.6	-12.2
Southern	-10.8	-6.7	-11.7
Southern Pacific	-16.5	-9.6	-12.8
St. Louis & Southwestern	-14.2	-8.5	-12.1
Atchison, Topeka & Santa Fe	-13.0	-7.4	-11.9

The use of a current cost approach would make it more difficult for the railroads to achieve revenue adequacy. This is because the great increase in value assigned to the asset base under a current cost approach would require the railroads to significantly increase their net railway operating income in order to earn an adequate return. For example, as shown in table 4.7, under ICC's existing approach, the Burlington Northern Railroad would have needed about $205 million more in net railway operating income in 1984 than the $467 million it earned on an RRB basis in order to be revenue adequate. To meet the 1984 cost of capital standard under the traditional approach, the Burlington Northern would have needed about $127 million more than the $547 million it earned under depreciation accounting. In contrast, under a current cost approach, the Burlington Northern would have needed over $1.8 billion more in net railway operating income in 1984 to meet the cost of capital standard and be considered revenue adequate.

Table 4.7

Additional Net Railway Operating Income Needed to be Revenue Adequate in 1984

Major Class I railroads	ICC's existing method	Traditional approach	Current cost approach
	-----------	(thousands)	-----------
Baltimore & Ohio	$197,962	$147,428	$ 647,102
Chesapeake & Ohio	143,967	105,953	526,086
Seaboard	324,012	194,602	1,144,911
Burlington Northern	205,475	127,428	1,846,263
Union Pacific	333,817	241,844	1,166,718
Missouri Pacific	318,775	190,923	949,033
Western Pacific	36,012	21,581	144,077
Norfolk & Western	250,817	153,851	979,370
Southern	242,778	214,613	656,840
Southern Pacific	414,075	298,283	1,099,462
St. Louis & Southwestern	93,474	65,247	220,460
Atchison, Topeka & Santa Fe	373,166	252,543	1,183,508

BLANK PAGE

ISSUES SURROUNDING A CURRENT COST APPROACH

--SHIPPERS HAVE OPPOSED ICC'S CURRENT COST APPROACH ON SEVERAL GROUNDS.

- APPLYING CURRENT COSTS TO REVENUE ADEQUACY IS CONTRARY TO REGULATORY AND INDUSTRY PRACTICE AND WOULD MAKE RAILROAD REPORTING NONCOMPARABLE TO THAT OF OTHER INDUSTRIES.

- CALCULATION OF THE CURRENT COST INVESTMENT BASE AND THE REAL COST OF CAPITAL REQUIRES CONSIDERABLE SUBJECTIVE JUDGMENT.

- ALTERNATIVE METHODS EXIST TO ACCOUNT FOR THE EFFECTS OF INFLATION.

--CONCERN ALSO EXISTS THAT THE USE OF A CURRENT COST APPROACH MAY OVERSTATE THE VALUE OF THE RAILROADS' ASSET BASE.

ISSUES SURROUNDING A CURRENT COST APPROACH

A current cost approach would make interindustry comparisons difficult. Depreciated original cost accounting is the most commonly used system for reporting the financial performance of businesses. While some utility commissions allow consideration of the "fair value" of assets in regulatory proceedings, most specifically require use of depreciated original cost and none consider current costs exclusively. Depreciated original cost is also the accounting system used in corporate annual (financial) reports and conforms to generally accepted accounting principles.

The Commission's current cost system uses a series of indexes to estimate the current reproduction cost of items in the various classes of assets. Several problems can arise in making the assumptions and judgments required to estimate current costs. First, original cost figures are not available in all cases. If there are any errors in the estimation of such assets' original costs, the application of indexes will compound these errors. Second, the reproduction cost of the assets within each class may not change at uniform rates. For example, under ICC's existing system of accounts, computers are contained in the same asset class as buildings; however, the cost of computers has not changed at the same rate as the cost of buildings. Third, the indices do not fully account for technological or other changes that make certain assets obsolete. With some exceptions, the index for each asset class is used to estimate the reproduction costs of assets in that class, regardless of whether the asset would be replaced with different assets today. Finally, any errors in an index itself are compounded as the number of periods to be indexed increases.

Some of the problems created by these assumptions can be illustrated by examining what happens to land values under ICC's current cost approach. In many cases, the original cost of land parcels is unknown. Consequently, they have been replaced on the railroads' books by past valuations of the land. Because of the extreme difficulty in determining the current value of each piece of land used for transportation purposes by the railroads, a single index is used for all land. Thus, the book value of land in rapidly growing areas is inflated at the same rate as land in isolated regions.

The potential importance of any errors in land valuation caused by a current cost approach can be seen in the greater proportion represented by land in the current cost investment base. Land values, which are not depreciable, rise as the value of depreciable assets decline. For example, while land values make up about 2 percent of the Burlington Northern Railroad's 1984 original cost investment base, land constitutes about 12 percent of its 1984 investment base under ICC's current cost approach.

Calculation of the real cost of capital, the standard against which the current cost ROI is compared, also requires that several assumptions be made. To avoid excessive compensation for inflation, the nominal cost of capital must be adjusted to remove the inflation premium; therefore, an initial issue is whether this inflation premium should be a measurement of inflation in the rail industry or in the general economy. If a general measure of inflation is determined to be most appropriate, a decision needs to be made about which general index to use. Three widely used measures are the Gross National Product Price Deflator, the Consumer Price Index, and the Producer Price Index.

Finally, the Staggers Rail Act requires that revenue adequacy procedures cover the effects of inflation, but the act does not specify how this should be done. There are ways to account for the distorting effects of inflation without using a current cost accounting system. ICC currently uses RRB accounting with a cost of capital as a way to account for inflation. As noted earlier, if a railroad earns a depreciated original cost ROI equal to the cost of capital, it will recover an amount with the same discounted present value as the amount that results from earning a depreciated current cost ROI equal to the real cost of capital.

BLANK PAGE

CURRENT COST APPROACH COULD OVERSTATE THE VALUE OF THE INVESTMENT BASE

--SOME ASSETS HAVE BECOME ECONOMICALLY OBSOLETE BUT, UNDER A CURRENT COST APPROACH, THEY MAY BE ASSIGNED VALUES THAT DO NOT REFLECT THEIR DIMINISHED MARKET WORTH.

--ASSETS ON LINES THAT MAY NEVER EARN A FULL RETURN ARE SHOWN AT CURRENT COST DESPITE THE FACT THAT THEIR REDUCED VALUE TO THE RAILROADS MEANS THEY ARE NOT LIKELY TO BE REPLACED.

--OLDER ASSETS--THOSE MOST LIKELY TO BE OBSOLETE OR ON ECONOMICALLY UNVIABLE LINES--ARE LIKELY TO REPRESENT A LARGER PROPORTION OF THE ASSET BASE UNDER A CURRENT COST APPROACH THAN UNDER ORIGINAL COST ACCOUNTING.

--A SATISFACTORY WAY TO FULLY COMPENSATE FOR THIS PROBLEM IS NOT APPARENT.

CURRENT COST APPROACH COULD OVERSTATE THE VALUE OF THE INVESTMENT BASE

ICC's current cost approach estimates the current depreciated reproduction cost of each asset in the railroad's asset base. The cost of reproducing a particular asset, however, may not be a good measure of the value of the asset. Railroads have assets that would either be replaced by different assets or not replaced at all. For example, a building built 50 years ago might be replaced with a very different building today. Further, while some assets might not be obsolete, their location on lines that are earning subnormal returns may make eventual abandonment desirable. Such assets, in both of these instances, would not be worth their estimated reproduction costs.

The most recent available studies have indicated that there may be extensive excess capacity in the railroad industry.[1] The actual abandonment by the major railroads of thousands of miles of track since 1980, the projected abandonment of additional track, and the extensive write-downs of assets by several railroads all indicate the presence of assets not worth their replacement cost to the railroads that own them.

Assets destined for abandonment are likely to be older than those on more viable lines. Railroads are more likely to invest more heavily in lines considered to be viable in the long-run than in those never expected to earn returns sufficient to justify large investments. The assets on the more viable lines are thus likely to be newer because they are replaced more frequently.

Older, potentially obsolete assets represent a much greater proportion of the asset base under ICC's current cost approach than under original cost accounting. Older assets, whether only partially depreciated or carried at net salvage value, are represented on the railroads' books by costs that do not show the effects of price inflation or technological advances. Under ICC's current cost approach, however, the cost of these assets are inflated to estimate their current (depreciated) reproduction cost.

To illustrate the effect, consider a hypothetical railroad with only two assets that are identical except for age. The first asset was bought 10 years ago for $100. The second was bought 1 year ago for $155--the price of the first, inflated by a constant annual inflation rate of 5 percent. Assuming a 20-year life, straight-line depreciation, and no salvage value, the first asset would be currently carried on the books at $50 ($100 dollars minus 50 percent depreciation). The second asset would be currently carried on the books at $147 ($155 minus 5 percent depreciation). The book value, or original cost, of the older asset would be about 25 percent of the total asset value of $197. Under ICC's current cost approach, because the assets were identical and would be replaced at the same cost today, the reproduction cost of each asset would be estimated at $163, assuming continued inflation at the 5-percent rate. Again, the first asset would be depreciated by 50 percent and the second by 5 percent, providing a total asset base of $236. The older asset, however, now valued at $81, would represent more than 34 percent of the current cost asset base.

---

[1] Harris, R.G. "Economic Analysis of Light Density Rail Lines," The Logistics and Transportation Review, 1980, Volume 16, No.1; and Grimm, C.M. "Excess Branch Line Capacity in the U.S. Railroad Industry: A Simulation Model Approach" (unpublished), March 1986.

Another reason a current cost approach may overstate asset values is ICC's reliance on predecessor costs for several railroads. (See p. 93.) In each case, the book value set by the market is not used and the higher predecessor costs are indexed up to current reproduction costs.

We were not able to identify an adequate solution for the potential problem of overstating asset values under a current cost approach. ICC and railroad industry observers we spoke with could not specify a satisfactory means of identifying assets that, over the long run, would not earn returns sufficient to justify replacement. Even if there were a way to identify the assets earning subnormal returns, ICC and industry officials told us that it would be extremely expensive to do so on a systemwide basis and actual implementation of the system would require extensive use of subjective judgment.

BLANK PAGE

MULTIPLE INDICATOR APPROACH FOR MEASURING REVENUE ADEQUACY

--PRIOR TO THE ADOPTION OF ITS EXISTING APPROACH, ICC USED A MULTIPLE INDICATOR APPROACH TO DETERMINE REVENUE ADEQUACY.

--IN APPLYING THIS APPROACH, ICC USED THREE CLASSES OF INDICATORS,

- ROI EQUAL TO THE COST OF CAPITAL,
- FINANCIAL RATIOS, AND
- FUNDS FLOW ANALYSIS.

--FINANCIAL RATIOS WERE USED TO INDICATE THE SOUNDNESS OF THE RAILROAD'S FINANCIAL CONDITION.

--FUNDS FLOW ANALYSIS WAS USED TO DETERMINE IF THERE WAS A SUFFICIENT FLOW OF FUNDS TO MEET CAPITAL SPENDING REQUIREMENTS.

--SOME SHIPPER ORGANIZATIONS HAVE PROPOSED THAT ICC BE REQUIRED TO CONSIDER INDICATORS OTHER THAN ROI IN DETERMINING RAILROAD REVENUE ADEQUACY.

MULTIPLE INDICATOR APPROACH FOR MEASURING REVENUE ADEQUACY

Prior to the Staggers Rail Act, ICC used a multiple indicator approach to determine revenue adequacy. This approach was adopted in January 1978. Only one revenue adequacy determination was made using this multiple indicator approach. In December 1979, ICC concluded for 1978 that out of 35 Class I railroads, 13 were revenue adequate and 22 were revenue inadequate (excluding Conrail).

Table 4.8

Revenue Adequacy Determination for 1978
Using Multiple Indicator Approach

Revenue adequate railroads	Revenue inadequate railroads
Clinchfield	St. Louis-San Francisco
Bessemer & Lake Erie	Louisville & Nashville
St. Louis & Southwestern	Seaboard Coast Line
Norfolk & Western	Colorado & Southern
Southern	Baltimore & Ohio
Union Pacific	Kansas City Southern
Elgin, Joliet & Eastern	Fort Worth & Denver
Missouri Pacific	Atchison, Topeka & Santa Fe
Western Maryland	Western Pacific
Denver & Rio Grande Western	Southern Pacific
Soo Line	Burlington Northern
Chesapeake & Ohio	Detroit, Toledo & Ironton
Pittsburgh & Lake Erie	Florida East Coast
	Chicago & Northwestern
	Illinois Central Gulf
	Duluth, Missabe & Iron Range
	Missouri-Kansas-Texas
	Boston & Maine
	Grand Trunk Western
	Chicago, Milwaukee, St. Paul & Pacific
	Delaware & Hudson
	Chicago, Rock Island & Pacific

Source: ICC.

ICC's justification for using a multiple indicator approach stemmed from its interpretation of the 4R Act. ICC felt that the 4R Act mandated that ICC give attention to a direct appraisal of the railroads' debt and equity capital needs and to the railroads' ability to finance those needs. To perform this appraisal, ICC selected three measures:

--ROI equal to the cost of capital.

--Financial ratios.

--Funds flow analysis.

ICC selected ROI equal to the cost of capital as a measure of revenue adequacy because ROI was considered a traditional measure of the profitability of an industry's investment, and the cost of capital was considered an acceptable measure of a fair return on the capital invested. ICC also believed that the cost of capital indicated the rate of return that was conducive to the retention and attraction of capital. ICC decided to use this measure as a point of reference in determining an adequate revenue level for the railroads. ICC, however, did not believe that ROI equal to the cost of capital should be the only indicator. The Commission felt that ROI equal to the cost of capital did not permit an appraisal of all the carrier's financing needs whereas a multiple indicator approach would incorporate the traditional regulatory measure of the profitability of a firm's investment as well as other measures that were more commonly used by industries in competitive environments.

ICC selected several financial ratios that would permit ICC to examine the soundness of a railroad's financial condition. ICC felt that the 4R Act specifically referred to the sufficiency of a rail carrier's revenue to make needed capital investment. The primary financial ratios ICC chose to focus on were fixed charge coverage, proportion of debt in the carrier's capital structure, return on shareholders' equity, return on total capitalization, current ratio, operating ratio, and the carrier's bond ratings.

The purpose of using a funds flow analysis was to find a direct means for measuring revenue need. The funds flow model was intended to project the needed capital outlays and other fund requirements of the railroads, determine the amount of funds available to the carriers from operations and capital sources, and ascertain the shortfall of the available funds for the projected requirements. This needed revenue amount could then be translated into an ROI.

While the ICC was specific about the indicators that should be used to determine revenue adequacy, it did not specify the relative importance of these different indicators. Although ICC acknowledged that each measure was important, it did not set any weighting system for the three measures in its rulemaking process, largely because of disagreement among the shippers and the railroads about the relative importance of the criteria.

For its 1978 revenue adequacy determination--the only determination made using multiple indicators--ICC viewed each railroad's revenue adequacy on a case-by-case basis, emphasizing different indicators in each analysis. For example, the Commission concluded that the Atchison, Topeka & Santa Fe Railroad was not revenue adequate because of its low rate of return and high capital spending level, although it found the railroad to have a sound financial condition as measured by the financial ratios and a healthy investment level for the years 1975-77. On the other hand, ICC determined that the Pittsburgh & Lake Erie Railroad was revenue adequate although its rates of return were lower than the top eight railroads--the benchmark ICC used. In support of revenue adequacy, ICC found that the Pittsburgh & Lake Erie Railroad had a high investment level and its earnings were sufficient to support a fairly high level of capital spending and to maintain a sound financial condition. The Pittsburgh & Lake Erie Railroad also did not have any outstanding bonds.

In general, in the 1978 revenue adequacy determination, ICC placed greater emphasis in its case-by-case analysis on ROI than on the other measures. The Chief of the Financial Analysis Section of ICC's Bureau of Accounts told us that by the time this revenue adequacy determination was made, the Commission already was leaning heavily toward ROI as the most significant measure. Although the procedures at that time called for multiple measures, he told us that ICC was evolving toward ROI equal to the cost of capital as the primary and only measure of revenue adequacy because the Commission felt the other indicators were driven by the same basic data used to determine ROI.

A VARIETY OF INDICATORS CAN BE USED TO EVALUATE REVENUE ADEQUACY

Table 4.9

Major Indicators Used by ICC and Industry Analysts to Assess Railroad Financial Health

Organization	Indicators: Rates of return[a]	Earnings[b]	Cash flow	Operating ratio	Financial ratios[c]	Other
ICC	x	x		x	x	ICC also considered the flow of funds from railroads' operations to support capital outlays.
Goldman Sachs	x	x	x	x	x	A Goldman Sachs analyst stated that they also consider intangiable factors such as management and service territory. Indicators are looked at over a 5-year time horizon.
Kidder, Peabody & Co.	x	x	x	x	x	A Kidder Peabody analyst stated that discretionary cash flow is an important ratio because it permits them to assess the overall economic climate of the firm.
Moody's	x		x		x	Moody's analysts stated that qualitative indicators such as business characteristics are very important in their bond ratings. Financial conditions are but one aspect of the ratings.
Morgan Stanley	x	x		x	x	Not applicable.
Paine Webber			x		x	A Paine Webber analyst stated that they consider qualitative indicators such as quality of management, but give no fixed weight to them. They also examine all the basic balance sheet indicators.
Printon, Kane Research	x	x			x	A Printon Kane analyst stated that it was important to examine the interplay of the income account with the balance sheet.
Salomon Brothers	x		x		x	Not applicable.
Standard & Poor's	x	x	x	x	x	Standard & Poor's analysts stated that about 75% of their assessment is based on qualitative factors. They also account for the business cycle.

[a] Includes various rate of return, for example, return on net investment, return on stockholders' equity, or return on total capitalization.

[b] Includes various earnings measures, for example, earnings per share.

[c] Includes various ratios, for example, the debt/equity ratio or the debt/total capital ratio and other ratios that are derived from the balance sheet and income statement.

A VARIETY OF INDICATORS CAN BE USED TO EVALUATE REVENUE ADEQUACY

Several sources exist for identifying indicators that can be used to measure railroad revenue adequacy. These include the indicators ICC used in its initial revenue adequacy determinations; indicators ICC employs in its "early warning system," which is an internal mechanism to target railroads that have financial difficulties;[1] indicators used by stock analysts to evaluate the desirability of railroad holding company stock; and indicators used by bond analysts to evaluate the risk associated with railroad debt instruments.

In evaluating the indicators used by these sources, we found that a wide variety of indicators is used. For instance, some of the stock analysts we spoke to look at a multitude of ratios that measure profitability, liquidity, and ability to repay debt whereas others are more partial to certain specific ratios. ICC focuses on eight financial ratios in addition to ROI and bond ratings in its early warning system.

One problem we found associated with the use of different ratios is that ratios with similar names are often defined differently. Several analysts we spoke with told us that they look at the return on capitalization; however, we discovered that they calculate return on capitalization the same way return on equity is normally calculated. While other analysts said that they use ROI, their definition differs from ICC's definition of ROI.

A second, more intractable, problem is that no weighting scheme exists to evaluate the results of the indicators. This is true for the stock and bond analysts we spoke with as well as for ICC. One analyst told us that his firm does not weight by formula; if a ratio looks incorrect, he tries to find out why, and he often looks at factors other than quantitative ratios.

---

[1] The early warning system is ICC's mechanism for highlighting railroads that either are having financial difficulty or could have financial difficulties. In this system, ICC targets a number of railroads which it feels deserve special attention and closely monitors those railroads' financial situation. In addition to various financial ratios, ICC also looks at intangible measures such as merger proposals. The early warning system is an internal mechanism used to keep the Commission apprised of the industry's financial environment. Its findings have no impact on revenue adequacy determinations or rate-setting.

Finally, we found that most sources tend to employ significant judgment in their financial analysis. The bond analysts, especially, weight quantitative indicators with qualitative factors such as the quality of the railroad's management. We were told that the evaluation of financial conditions are but one aspect of ratings done by one bond house. Stock analysts also consider qualitative indicators such as the quality of management although, as one stock analyst said, no fixed weight is given to these indicators. Besides management, other qualitative factors used by analysts include change in leadership, potential mergers and buyouts, and labor union activities. ICC, in its early warning system, also considers such factors.

BLANK PAGE

MULTIPLE INDICATORS SELECTED TO EVALUATE REVENUE ADEQUACY

Table 4.10

Comparison of Multiple Indicators Selected

Indicators	Standard	Relevant portion of Interstate Commerce Act's revenue adequacy definition
Return on investment	Greater than or equal to the ICC determined cost of capital.	Provide a reasonable return on capital employed.
Return on equity	Greater than or equal to the ICC determined cost of equity.	Provide a reasonable return on capital employed. Permit the raising of needed equity capital.
Operating ratio	Less than or equal to 85 percent.	Adequate revenues to cover operating expenses under efficient management.
Current ratio	Greater than or equal to 1.0.	Assure repayment of debt.
Fixed charge coverage	Greater than or equal to 3.5.	Assure repayment of debt.
Capital structure ratio	Greater than 20% but less than 50% of total capital.	Assure repayment of a reasonable level of debt.
Bond rating	Investment grade (BBB or better).	Assure repayment of a reasonable level of debt.

Source: ICC and Standard & Poors.

MULTIPLE INDICATORS SELECTED TO EVALUATE REVENUE ADEQUACY

To illustrate the application of a multiple indicator approach, we selected six indicators, in addition to ROI, to use to evaluate the revenue adequacy of the selected railroads. These measures were those most commonly employed by ICC in its early warning system and earlier revenue adequacy procedure and by the stock and bond analysts we contacted. These measures were also selected to reflect the statutory language regarding revenue adequacy; namely, Title 49 U.S. Code Section 10704(a)(2) of the Interstate Commerce Act which states that

> ". . . the Commission shall maintain and revise as necessary standards and procedures for establishing revenue levels for rail carriers . . . that are adequate, under honest, economical, and efficient management, to cover total operating expenses, including depreciation and obsolescence, plus a reasonable and economic profit or return (or both) on capital employed in the business . . . assure the repayment of a reasonable level of debt, permit the raising of needed equity capital, and cover the effects of inflation; and attract and retain capital . . ."

As a benchmark for evaluation, we used the standards ICC employs in its early warning system. The bond ratings standards, however, were obtained from Standard & Poor's. We did not weight the indicators to arrive at a composite determination. Rather, we present the results as if all the indicators have equal weight.

REVENUE ADEQUACY RESULTS-- MULTIPLE INDICATOR APPROACH

Table 4.11

1984 Revenue Adequacy Results-- Multiple Indicators Approach

Railroad	Standard met for 1984? Return on investment	Return on equity	Operating ratio	Current ratio	Fixed charge coverage	Capital structure	Bond rating
Baltimore & Ohio	No	No	No	Yes	No	Yes	Yes
Chesapeake & Ohio	No	No	No	Yes	Yes	No	Yes
Seaboard	No	No	No	Yes	Yes	Yes	Yes
Burlington Northern	No	No	Yes	Yes	Yes	Yes	Yes
Union Pacific	No	No	No	Yes	Yes	Yes	Yes
Missouri Pacific	No	No	No	No	No	Yes	Yes
Western Pacific	No	No	No	Yes	No	No	Yes
Norfolk & Western	No	No	Yes	Yes	Yes	No	Yes
Southern	No	No	Yes	Yes	Yes	No	Yes
Southern Pacific	No	No	No	No	No	Yes	Yes
St. Louis & Southwestern	No	No	No	Yes	Yes	No	Yes
Atchison, Topeka & Santa Fe	No	No	No	Yes	Yes	Yes	Yes

REVENUE ADEQUACY RESULTS-- MULTIPLE INDICATOR APPROACH

If all of the multiple indicators are considered to be equally important, then none of the selected railroads would be considered revenue adequate using the multiple indicator approach. While many of the railroads met the standards that measure their ability to repay a reasonable level of debt, none of the selected railroads had returns on investment or equity equal to ICC's standard. The actual results of the financial indicators for the selected railroads are contained in appendix IV.

As noted in table 4.11, of the Class I railroads we reviewed, the Burlington Northern Railroad had the best performance with respect to the standards. It surpassed ICC's standards for all the ratios with the exception of the return on investment, for which it had a shortfall of 4.8 percentage points and the return on equity, for which it had a shortfall of 0.8 percentage points. The Southern Pacific Railroad and the Missouri Pacific Railroad recorded the worst performance, exceeding ICC's standards for only the capital structure ratio, which measures the relationship of debt financing to the total of debt and equity financing, and for the bond rating.

ISSUES SURROUNDING THE MULTIPLE INDICATOR APPROACH

--THE RAILROADS AND ICC HAVE OPPOSED THE USE OF A MULTIPLE INDICATOR APPROACH ON SEVERAL GROUNDS.

- MANY OF THE INDICATORS ARE SHORT-TERM INDICATORS WHILE REVENUE ADEQUACY IS A LONG-TERM CONCEPT.
- THERE ARE NO WIDELY AGREED-UPON STANDARDS TO APPLY IN EVALUATING THE RESULTS OF THE INDICATORS.
- THERE IS NO GENERALLY ACCEPTED METHOD TO WEIGHT MULTIPLE INDICATORS; THEREFORE, JUDGMENT MUST BE USED IN EVALUATING THE RESULTS.
- THE USE OF JUDGMENT OPENS THE REVENUE ADEQUACY DETERMINATION PROCESS TO POTENTIAL MANIPULATION.

ISSUES SURROUNDING THE MULTIPLE INDICATOR APPROACH

The railroads and ICC have argued that a multiple indicator approach may not be practical. Although the use of multiple indicators could permit a complete assessment of all facets of a railroad's financial condition, the railroads and ICC feel that the practical disadvantages arising from a multiple indicator approach outweigh this advantage.

The railroads and ICC oppose the use of a multiple indicator approach on several grounds. An initial concern is that many of the indicators are short-term indicators while revenue adequacy is viewed as a long-term concept. In its 1981 proceeding that established its existing approach, ICC stated that financial ratios and funds flow analyses were "inappropriate as indicators of long term revenue adequacy," and were only appropriate for determining "the short term viability of railroads." This opinion was borne out in our discussions with stock and bond analysts. They examine these indicators usually on a quarterly or annual basis to assess railroad financial health. Unlike ICC, these financial analysts are more concerned with a more immediate return on their investments rather than a long-term forecast of the firm's health.

Even if multiple indicators could be used to make long-term assessments, ICC could still have difficulty in establishing benchmarks which would be accepted by the rail industry, shippers, and financial analysts, and which could be used to compare the performance of the railroads. The Chief of the Financial Analysis Section of ICC's Bureau of Accounts told us that this type of analysis was more of an art form than a science, and that there was wide disagreement among financial analysts about what was a good value for the various indicators. He noted that the Norfolk & Western Railroad's and the Southern Railroad's low capital structure ratios could be a result of their holding company's decision to conduct all the railroads' financing at the holding company level rather than a reflection of the railroad's financial condition. (See app. IV.) His view was echoed by many of the stock and bond analysts with whom we spoke. This situation could make it difficult for ICC to determine if one railroad is necessarily better off than another.

A final problem with this approach is that there appears to be no generally accepted method to weight the multiple indicators, requiring the use of judgment in evaluating the results. The different financial analysts we contacted all had different methods of analysis even though they all examined many of the same basic indicators. Most of the analysts said that they do not have a formula to weight these indicators and would often use intangible measures to influence their final analysis. Therefore, two analysts, using the same information, could derive different conclusions about the railroad in question.

ICC also does not have a weighting system for the multiple indicators in its early warning system. Further, in its first revenue adequacy proceeding--which used the multiple indicator approach--ICC did not establish weights for the ratios even though it acknowledged that this raised a problem.

Consequently, the use of judgment in a multiple indicator approach could open the revenue adequacy determination process to potential manipulation, with some indicators receiving emphasis for one group of railroads while a different group of indicators receives emphasis for other railroads. This fear has been voiced by the railroads and ICC officials as a major objection to a multiple indicator approach.

SECTION 5

OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES, SCOPE, AND METHODOLOGY

In his April 22, 1985, letter, the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce asked us to review how ICC was implementing the Staggers Rail Act of 1980. In particular, the Chairman was concerned that ICC's implementation was unbalanced and too bent in favor of the railroads. After discussions with the Chairman's office, we agreed to examine several aspects of ICC's implementation of the Staggers Rail Act, including alternative methods for determining railroad revenue adequacy.

To provide a thorough examination of railroad revenue adequacy, we agreed to

--provide information on recent trends in railroad financial indicators,

--compare the railroads' financial performance with that of comparable industries,

--determine how ICC measures revenue adequacy,

--identify alternative approaches for measuring revenue adequacy, and

--determine if any railroads would be revenue adequate if alternative approaches were used.

To provide information on recent trends in railroad financial indicators, we used data from 1975 to 1984, the most recent year available, for all Class I railroads. We selected this time frame in order to have an equal number of years both before and after the passage of the Staggers Rail Act. This time frame allowed us to identify trends that began before as well as after the act's passage. We used aggregated data that was obtained from the financial reports filed by the Class I railroads with ICC. These data were aggregated by either ICC or the Association of American Railroads--the railroads' trade association. We did not, however, verify the accuracy of this data. To identify which indicators to examine, we (1) reviewed available reports on railroad financial health, (2) reviewed the indicators ICC used in prior revenue adequacy decisions and in its early warning system, and (3) consulted with stock, bond, and investment banker analysts.

To determine the industries to which we could compare the railroads' financial performance, we asked stock, bond, and investment banker analysts to identify the industries that they thought were comparable to the railroads in terms of such factors as structure, regulatory climate, capital intensiveness, and sensitivity to the changes in the general economy. We also reviewed reports in which similar comparisons have been made. For the industries identified, we collected data from publicly available sources for as many of the financial indicators identified in the first objective as possible. Where data were not strictly comparable or where we calculated the financial indicators on the basis of reported data, we have made the appropriate notations. These two factors may limit, to some extent, the usefulness of these interindustry comparisons. Appendix II also discusses how we selected industries for comparison with the railroads.

To determine how ICC measures railroad revenue adequacy, we (1) reviewed the legislative history of revenue adequacy and ICC's 1981 decision adopting its current approach, (2) examined the decisions on revenue adequacy ICC has issued since 1981, (3) interviewed former ICC officials who established the current process, and (4) interviewed current ICC officials responsible for the Commission's recent decisions on revenue adequacy. In addition, to develop a perspective on the impact of ICC's revenue adequacy determinations, we reviewed ICC documents and interviewed Commission staff to determine to what extent revenue inadequate railroads had used the additional, limited rate-making freedom provided to revenue inadequate railroads by the Staggers Rail Act.

To identify alternative approaches for measuring revenue adequacy, we (1) reviewed the revenue adequacy method ICC used under the 4R Act, (2) identified the methods state and federal regulatory commissions use to determine ROI and the cost of capital, (3) reviewed studies prepared by shipper and railroad organizations that analyzed the impact of alternative approaches, and (4) reviewed legislation that contained proposals for altering ICC's current approach. From these sources, we selected four alternatives that we believed represented the major alternative approaches for measuring revenue adequacy. We recognize that other methods may exist; however, the other methods represent only minor variations of the approaches we selected, and the impact of the variations can be assessed using the data contained in our report.

To assess the impact of the selected alternatives, we used 1984 data for the nation's major Class I railroads. We used 1984 data because it was the most recent year available. We selected the 12 largest railroads--which comprise the nation's seven major railroad systems--because they account for over 70 percent of the 1984 operating revenues of the nation's Class I railroads. As such, if any of the alternative approaches would show these railroads to be revenue adequate, the impact would be felt by the largest number of rail users.

Table 5.1

Major Class I Railroads

System/Railroad	1984 operating revenues (thousands)	Percentage of total Class I revenues
CSX Corporation:[a]	$ 4,848	16.5
Chessie System:	(2,101)	
Baltimore & Ohio[b]	(1,051)	
Chesapeake & Ohio[b]	(1,050)	
Seaboard System[b]	(2,747)	
Burlington Northern[b]	4,440	15.1
Union Pacific Corporation:[a]	3,863	13.1
Union Pacific[b]	(1,921)	
Missouri Pacific[b]	(1,795)	
Western Pacific[b]	(147)	
Norfolk Southern Corporation:[a]	3,509	11.9
Norfolk & Western[b]	(1,714)	
Southern System[b]	(1,795)	
Southern Pacific Corporation:[a]	2,625	8.9
Southern Pacific[b]	(2,189)	
St. Louis & Southwestern[b]	(436)	
Atchinson, Topeka & Santa Fe[b]	2,305	7.8
Total	$21,590	73.3

Total all Class I railroads $29,453

[a] Includes only railroad revenues.

[b] Railroads.

Source: Association of American Railroads.

To measure revenue adequacy, we used financial indicators calculated by ICC's Bureau of Accounts. We verified the accuracy of these indicators by entering test data into the ICC computer program that calculates the financial indicators and spot checking selected data entries. We also retained a consultant familiar with ICC's financial reporting system to assist us in extracting data from the railroads' financial reports and in calculating the cost of capital.

DATA LIMITATIONS

In 1983, ICC changed the basis for the railroads' financial reporting for track structures from the RRB method of accounting to the depreciation method of accounting. This change has affected many of the financial indicators we used and resulted in

1983-1984 data not being comparable to prior years. While it made this change for financial reporting purposes, ICC continued to use RRB accounting for regulatory purposes and to require the railroads to provide limited supplementary information. Where possible we have provided RRB as well as depreciation-based data in order to provide a continuous data series and to illustrate the impact of this accounting change.

COMPARISON OF RRB AND DEPRECIATION ACCOUNTING

Prior to 1983, the railroads used a unique method for accounting for their assets. While all other railroad assets, for example locomotives, were accounted for using traditional depreciation accounting, track structure was accounted for using RRB accounting. In 1983, ICC adopted depreciation accounting for track structures for financial reporting purposes; however, ICC retained RRB accounting for revenue adequacy and other regulatory purposes. In order to calculate ROI on an RRB basis, ICC requires the railroads to supply, in addition to their regular financial statements, a special supplemental report containing data developed using RRB accounting.

WHAT IS RRB ACCOUNTING?

Under RRB accounting the original cost of the track structure, including labor and material costs, is capitalized, that is, added to the asset base, and no systematic depreciation expense is taken. The cost of subsequent replacements of track structure material of equal quality is charged as an expense in the periods in which the replacements occur. Labor costs to make such replacements are also expensed.

Betterments occur when track structure materials are replaced by superior quality assets which make the track more useful, efficient, or durable. The added cost of the new superior material over the current cost of the material removed is capitalized and is therefore considered an asset. Also, the accounting for the betterment considers only the cost of the material. Labor costs are included in operating expenses of the period when the replacement occurs.

Under RRB accounting, track structure that is retired is written off as an expense in the year that the retirement occurs. The amount that is expensed is the capitalized amount; that is, the amount carried on the books for that particular track structure.

The following examples illustrate the accounting treatment of track structure replacements without and with a betterment. If a 115-pound rail line had been originally installed in 1955 at a cost of $2 million ($500,000 for rail and $1.5 million for all other costs including labor), it would have been capitalized and reported on the balance sheet at $2 million with no charge for track structure expenses. If the line were replaced in 1985 with equal quality assets, but at a cost of $3 million ($1 million for the 115-pound rail and $2 million for other costs including labor), the following would occur:

--The investment in the line would remain on the balance sheet at the original cost of $2 million.

--Track structure expenses for 1985 would be $3 million (the current cost of equal quality replacements including labor).

If the replacements in 1985 included 132-pound rail, rather than the existing 115-pound rail, the replacement would be considered a betterment since the heavier rail would allow increased loads over the line. Assuming the quality of the other material (such as ties) was not improved and their cost in 1985 was the same as in the previous example ($2 million), but the cost of the rail increased from $1 million for 115-pound rail to $2 million for 132-pound rail, then the following would occur:

--The balance sheet investment for the line would be increased from $2 million to $3 million (the $2 million cost capitalized for the line in 1955 plus the $1 million betterment portion of the rail replacement installed in 1985).

--Track structure expenses for 1985 would be $3 million (the current cost of equal quality replacements).

WHAT IS DEPRECIATION ACCOUNTING?

Depreciation accounting is an accounting method that systematically and rationally allocates the cost of capital assets, such as buildings and machines, over their estimated useful lives. The estimated useful life of an asset, which determines how the costs are allocated, considers both physical and economic factors. Physical life considers how long an asset can be used or how many units it can produce. Economic life deals with the changing market conditions and expectations for use of the asset. Neither the physical nor economic life of most assets can always be accurately estimated. The goal is to make the best estimate of the physical or economic life, whichever is shorter, and depreciate the asset on that basis.

Depreciation accounting includes numerous methods, but they all follow the concept of systematic and rational cost allocation. One of the most commonly used methods is straight-line. Under straight-line depreciation, equal portions of the depreciable cost are expensed each period throughout the estimated useful life of the asset. For example, if a business invested $10,000 in a new machine with an estimated useful life of 10 years and no salvage value, depreciation expense would be $1,000 ($10,000 ÷ 10 years) each year for 10 years.

METHOD USED TO SELECT INDUSTRIES FOR COMPARISON WITH RAILROADS

To compare the railroads' financial health with the financial health of other industries, we went through several steps.

To identify comparable industries, we contacted analysts from a selected group of stockbrokerages, bond rating firms, and investment bankers. We asked them to (1) identify industries that they believed were comparable to the railroad industry and (2) provide their rationales for comparability.

On the basis of their suggestions and the availability of data, we selected six industries to compare with the railroads. We collected data for the railroads' competitors, industries served by the railroads, and industries with characteristics similar to those of the railroads.

It should be noted that no one industry offers an ideal comparison with the railroads. For example, right of way is an extremely important barrier to entry in the railroad industry, whereas easy entry and exit from markets is characteristic of the trucking industry. The electric utilities are monopolies and are fully regulated, whereas railroads are subject to competition and have been partially deregulated. Aside from natural gas pipelines, the other selected industries do not face economic regulation and are relatively free to select their geographic markets.

We obtained the data used in the comparison from a wide variety of sources. We did so because we were unable to find any single source that had relevant data for all of the industries we considered. Our information came from the sources indicated in table II.1, with two exceptions. In the case of the chemical industry, the return on equity was obtained from the Statistical Abstract of the United States. The operating ratio for the oil and gas industry was calculated from data in Performance Profiles of Major Energy Producers, 1984, published by the Energy Information Administration, Department of Energy.

Table II.1

Sources and Coverage of Data Used for Interindustry Comparisons

Industry	Data sources	Coverage
Railroad	ICC	28 Class I railroads (1984 revenues greater than $87 million)
Trucking	American Trucking Associations	700 Class I carriers (1984 revenues greater than $5 million)
Electric utility	Department of Energy	178 major electric utilities
Natural gas pipeline	Department of Energy	43 major interstate natural gas pipeline companies
Steel	American Iron and Steel Institute	27 companies producing 83% of U.S. raw steel
Industrial chemicals & synthetics	Chemical Week	30 companies with 1984 sales greater than $96 million
Oil and gas	American Petroleum Institute	21 major oil companies

Because of limited data availability, none of our information is comprehensive. Each source provided a set of statistics from a sample of companies within an industry. The companies in each sample earned a large portion of the revenues for their industry, and the information we have provided should be indicative of overall industry performance. There is consistency in the fact that we have considered the finances only of the Class I railroads and the other industry samples tend to be composed of the other industries' larger firms as well. A more comprehensive sample of industry data could, however, result in figures that do not correspond exactly to those we have reported. Where there was a choice among sources, we used data from the source with the sample representing the greatest proportion of industry revenue.

We obtained data for five measures of financial health. The usual method for calculating them is shown in table II.2. The calculation of financial ratios, however, may vary according to the source. For example, the denominators of return on equity and return on total capitalization are sometimes calculated with end-of-year data and sometimes with mid-year-average data.

Table II.2

Methods for Calculating Financial Ratios Used in Interindustry Comparison

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Stockholders' equity}}$$

$$\text{Return on total capitalization} = \frac{\text{Net income + fixed charges}}{\text{Stockholders' equity + long-term debt}}$$

$$\text{Operating ratio} = \frac{\text{Operating expenses}}{\text{Operating revenues}}$$

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$\text{Capital structure ratio} = \frac{\text{Long-term debt}}{\text{Stockholders' equity + long-term debt}}$$

We could not find complete comparable historical data. Consequently, we used 1984 data, which is the most recent available for all industries and which we were generally able to obtain from one source for each industry. Use of 1984 data alone is likely to mask the effect of the business cycle on economic indicators and any improvement (or deterioration) on the financial health of the railroads vis-a-vis that of the other industries.

In many cases, the financial measures we used were calculated with data reported by diversified companies. It was not always possible to determine the reporting entity. For example, the financial reports of natural gas pipelines appear sometimes to contain data only from pipeline operations and, at other times, to contain data from all or part of a company's diversified operations, depending upon the practice of the individual company. The operating ratios we have shown are the only set of measures clearly to come from specific industry operations in a majority of cases.

While the financial indicators above provide a useful look at the financial health of the railroads relative to that of other industries, caution should be exercised in making any conclusions from table 3.9. Because of the many variations in the data, it may not be valid to assume that the relative ranking of the railroads' performance is correct when the measures of performance by other industries differ only by 1 or 2 percentage points.

COMPUTATION OF THE 1984 EMBEDDED COST OF DEBT

To facilitate comparison between ICC's existing approach for measuring revenue adequacy and the traditional approach for measuring revenue adequacy, we estimated the cost of embedded debt for 1984 on an industrywide basis for the six composite railroad systems ICC used in its 1984 cost of capital determination. The six railroad systems include 13 individual Class I railroads.

To arrive at the total long-term debt for each Class I railroad we added the following accounts from the railroads' annual financial reports:

--Funded debt unmatured.

--Equipment obligations.

--Capital lease obligations.

--Debt in default.

--Debt accounts payable to affiliates.

--Unamortized debt premiums.

To develop a weighting scheme, we totalled the long-term debt for all 13 of the railroads and calculated each railroad's share of the total long-term debt. For the debt rate, we used the ratio of interest expense to total long-term debt as calculated by the Association of American Railroads. Finally, to arrive at a composite embedded cost of debt, we weighted the debt rate for each railroad by its share of total long-term debt and totalled the result.

Table III.1

Estimated Cost of Embedded Debt, 1984

Class I railroad	Total long-term debt	Percent of composite total long-term debt	Debt rate	Weighted debt rate
	(thousands)	--------(percent)----------		
Baltimore & Ohio	$ 287,943	4.21	8.33	0.35
Chesapeake & Ohio	397,483	5.82	8.54	0.50
Seaboard	987,000	14.44	10.32	1.49
Burlington Northern	1,171,988	17.14	9.63	1.65
Union Pacific	499,968	7.31	9.69	0.71
Missouri Pacific	949,316	13.88	9.84	1.37
Western Pacific	155,146	2.27	13.94	0.31
Norfolk & Western	196,414	2.87	10.80	0.31
Southern	634,817	9.28	11.22	1.04
Southern Pacific	749,870	10.97	9.89	1.08
St. Louis & Southwestern	116,247	1.70	9.29	0.16
Atchison, Topeka & Santa Fe	615,998	9.01	9.70	0.87
Denver & Rio Grande	74,853	1.10	9.63	0.11
Total	$6,837,043	100.00		
		Estimated 1984 embedded cost of debt		= 9.95

Source: Analysis of Class I Railroads, Association of American Railroads and ICC.

COMPARISON OF 1984 FINANCIAL RATIOS OF SELECTED CLASS I RAILROADS TO ICC STANDARDS

Standard/Railroad	Return on investment	Return on equity	Operating ratio	Current ratio	Fixed charge coverage	Capital structure	Bond rating[a]
	(percent)					(percent)	
ICC Standard	15.8	17.3	<=85	>=1.0	>=3.5	20>=x<=50	>=BBB
Baltimore & Ohio	2.9	4.3	94.6	1.0	2.7	26.8	A+
Chesapeake & Ohio	4.3	7.7	86.5	1.1	7.0	17.5	A+
Seaboard	5.6	11.1	86.1	1.1	4.7	30.1	A+
Burlington Northern	11.0	16.5	78.7	1.3	9.4	25.3	AA
Union Pacific	4.1	6.5	89.9	1.3	4.8	20.8	AA
Missouri Pacific	3.6	12.0	89.6	0.8	2.8	45.8	AA
Western Pacific	0.2	-21.4	111.3	1.2	-0.1	84.5	AA
Norfolk & Western	5.2	11.5	80.9	2.3	22.0	7.7	AA
Southern	5.0	11.4	83.3	1.7	7.4	17.0	AA
Southern Pacific	-0.7	6.6	99.3	0.7	2.2	25.9	BBB
St. Louis & Southwestern	1.6	9.2	90.3	1.5	6.7	18.9	AA
Atchison, Topeka & Santa Fe	2.8	6.5	90.4	1.2	4.6	22.5	AA

[a] Standard & Poor's standard for bonds.

Source: ICC and Standard & Poor's.

Requests for copies of GAO reports should be sent to:

U.S. General Accounting Office
Post Office Box 6015
Gaithersburg, Maryland 20877

Telephone 202-275-6241

The first five copies of each report are free. Additional copies are $2.00 each.

There is a 25% discount on orders for 100 or more copies mailed to a single address.

Orders must be prepaid by cash or by check or money order made out to the Superintendent of Documents.

140